



## The Missouri Plan for Heart Disease and Stroke Prevention 2005-2010

From the Missouri Heart Disease and Stroke Prevention Advisory Board and the Missouri Heart Disease and Stroke Prevention Program

Governor Matt Blunt  
Julia M. Eckstein, Director

December 2005

# The Missouri Plan for Heart Disease and Stroke Prevention

## 2005-2010

Created by the Missouri Heart Disease and Stroke Prevention Advisory Board  
and the Missouri Heart Disease and Stroke Prevention Program



For additional copies of this report or information, contact:

**Missouri Heart Disease and Stroke Prevention Program**  
**Bureau of Cancer and Chronic Disease Control**  
**Missouri Department of Health and Senior Services**  
**920 Wildwood, PO Box 570**  
**Jefferson City, Missouri 65102-0570**  
**573-522-2896 (phone)**  
**573-522-2898 (fax)**  
**<http://www.dhss.mo.gov/HeartDisease>**  
**<http://www.dhss.mo.gov/Stroke>**

This publication was supported by Grant/Cooperative Agreement Number U50/CCU721332-04 from the Centers for Disease Control and Prevention, its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health and Senior Services at 573-522-2896.

Hearing and speech impaired citizens telephone 1-800-735-2966. VOICE 1-800-735-2466.

AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER Services provided on a nondiscriminatory basis.

# Acknowledgements

## Missouri Heart Disease and Stroke Prevention Advisory Board

### **Jo Anderson, Program Manager**

Diabetes Prevention and Control Program  
Department of Health and Senior Services

### **Dorothy Andrae**

Primaris

### **Aaron Bartlett**

Mid American Regional Council

### **Mari Ann Bihr, Health PE Consultant**

Missouri Department of Elementary and Secondary Education

### **Martina Bowden**

Kansas City Neighborhood and Community Services

### **Chris Buckland**

Division of State Parks  
Missouri Department of Natural Resources

### **Gail Carlson, MPH, PhD**

Outreach and Extension  
University of Missouri-Columbia

### **Chris Coffman, Public Health Planner**

Columbia/Bone County Health Department

### **Karen Cooper, Health Initiatives Director**

Heartland Affiliate  
American Heart Association

### **John Cyrus, Project Manager**

KC CDC/MPCA/Reach 2010

### **Katie Duggan, MPH, MS, RD**

Public Health Instruction  
St. Louis University Prevention Research Center

### **Bob Hall**

Division of Family Support  
Missouri Department of Social Services

### **James Herauf, Executive Director**

MAHPERD

### **Barbara Huddleston, Nutritionist III**

Division of Senior Services and Regulation

### **Robert Hudson, Administrator**

Butler County Health Department

### **Jerry D. Kennett, MD**

Missouri State Medical Association

### **Bonnie Linhardt, Advocacy Director**

American Heart Association

### **Anne Lock**

Center for Local Public Health Services  
Department of Health and Senior Services

### **Donna Mehrle**

Bureau of Health Promotion  
Department of Health and Senior Services

### **John Korte, FLMI, AIRC, AIE**

Life and Health Section  
Missouri Department of Insurance

### **David Ostlund, Representative**

Great Lakes Regional Council  
Missouri Parks and Recreation Association

### **Don Paulsen, Caregiver**

American Stroke Association

### **Leslie Porth, Vice President**

Health Improvement  
Missouri Hospital Association

### **Doug Randall, EMS Training Officer**

St. Louis Fire Department

### **Rita Reeder, Nutritionist**

Bureau of Cancer and Chronic Disease Control  
Department of Health and Senior Services

### **Wanda Roling, RN, Administrator**

Bureau of Health Care Oversight  
Department of Health and Senior Services

### **Debbie Summers, RN, MSN, Advanced Practice Nurse**

St. Luke's Health System  
Mid America Brain and Stroke Institute

### **Mary Thompson, MS**

St. Louis District Dairy Council

### **Carolyn Tilford, RN**

Educational Services  
Phelps County Regional Medical Center

### **Gayla Vandelicht, Executive Director**

Governor's Council on Physical Fitness and Health

### **Tuck VanDyne, Chief**

Office on Women's Health  
Department of Health and Senior Services

### **Patti VanTuinen, Health Educator**

Bureau of Healthy and Safe Families  
Department of Health and Senior Services

### **Diana Westerfield, DO**

Missouri Association of Osteopathic Physicians and Surgeons

### **Robert Whitlock, Director**

Missouri Kidney Program

### **Joy Williams, Chief**

Office of Minority Health  
Department of Health and Senior Services

## Missouri Heart Disease and Stroke Prevention Program Staff

### **Judy Alexiou, RNC, MPH, Program Manager**

### **Linda Powell, Assistant Program Manager**

### **Lisa Britt, Health Program Representative**

### **Karen Connell, Health Program Representative**

### **Kathy Craig, Health Program Representative**

### **Michael Dietz, Research Analyst/Epidemiology Specialist**

### **Sherri Homan, Epidemiologist**

### **Tara McKinney, Program Support**

## Graphic Design

### **Kristi Hart, Public Information Specialist**

Office of Community Health Information  
Department of Health and Senior Services



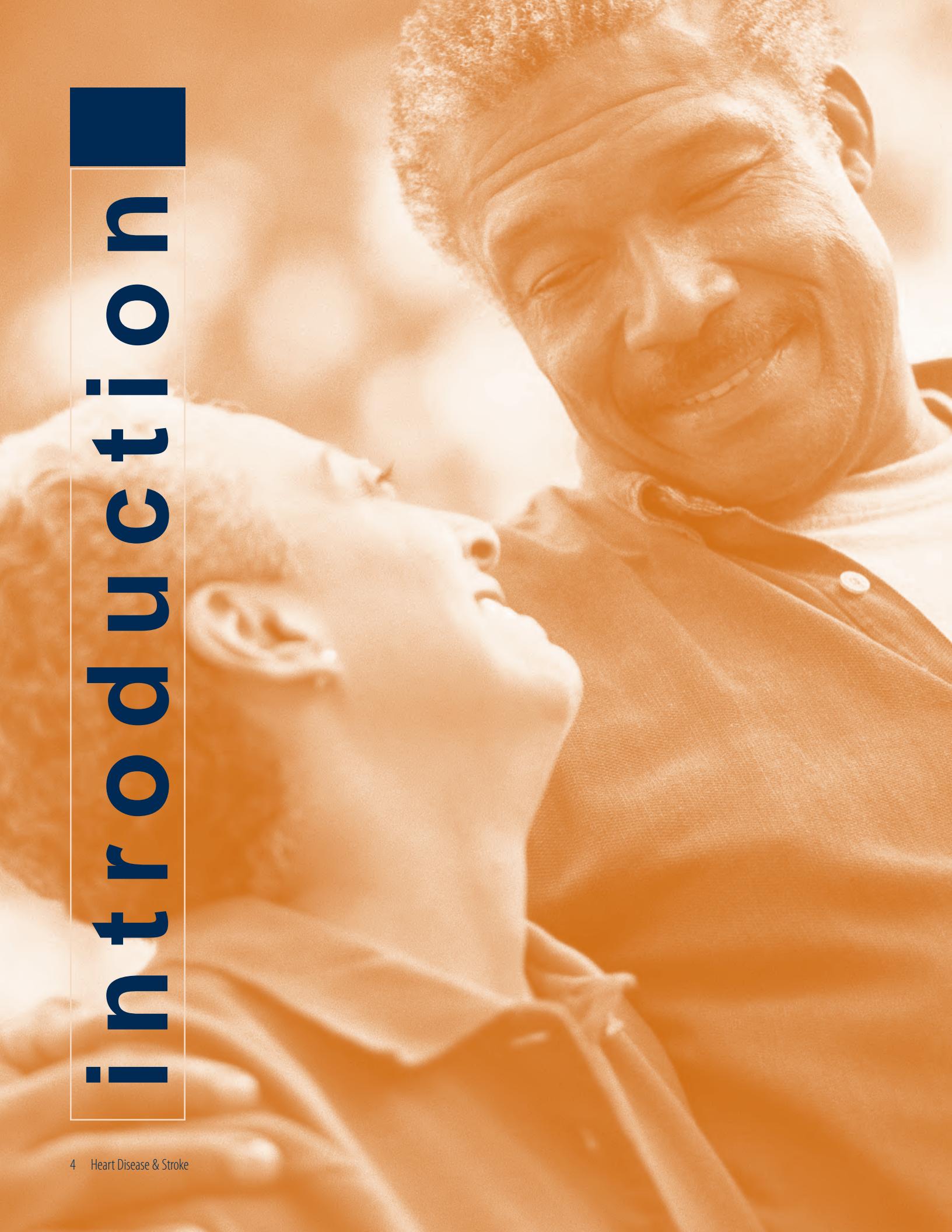
## The Missouri Plan for Heart Disease and Stroke Prevention 2005-2010

### Contents

Introduction .....	4
Background .....	6
Burden of Disease in Missouri .....	8
Addressing Disparities .....	14
Risk Factors .....	16
Goals and Objectives .....	20
Surveillance and Evaluation .....	28

### Appendices

Glossary of Terms .....	33
Acronyms .....	35
Internal and External Partners .....	36
AHA Chain of Survival .....	37
Crosswalk of Healthy People Objectives with Goals .....	38
Stroke Chain of Survival .....	39
JNC7 Reference Card .....	40
References .....	42

A close-up, sepia-toned photograph of an elderly couple. The man, on the right, has a full white beard and is smiling broadly. The woman, on the left, is also smiling and looking towards the man. They appear to be in a romantic or intimate setting.

# introduction

# Introduction

**Vision:** Healthy Hearts – Stroke Smart Missourians

**Mission:** To provide leadership and foster collaboration to prevent and reduce the effects of heart disease and stroke among all Missourians.

## Introduction

As in the United States, cardiovascular disease (CVD- which includes heart disease and stroke) is the leading cause of death in Missouri among all racial and ethnic groups and for both sexes. When separated, heart disease is the leading cause of death for all racial and ethnic groups, and for both sexes, with stroke the third leading cause of death. The economic impact of these diseases is also staggering, with cardiovascular diseases costing Missourians almost \$3.5 billion in direct hospital charges in 2003 alone.<sup>1</sup>

The majority of heart disease and stroke incidents can be prevented.<sup>2</sup> The major risk factors for the diseases are largely controllable and lifestyle related, such as tobacco use, physical activity, diet and maintaining a healthy weight.<sup>2,3</sup> Health promotion activities such as education and policy and environmental changes that promote a healthy lifestyle are important activities to improve the cardiovascular health of all individuals.

While these health promotion activities are important, it is also necessary for people to control other risk factors for heart disease and stroke, some of which are not preventable. The most important of these are high blood pressure and high cholesterol. These important risk factors for heart disease and stroke, though often preventable,<sup>2</sup> are also influenced by factors that people cannot control, such as sex, age, ethnicity and family health history. All individuals need to be screened for high blood pressure and high cholesterol, know and understand their numbers, and follow their doctor's recommendations for treatment, if necessary.

Despite remarkable declines in overall CVD mortality rates since 1950,<sup>4</sup> certain segments of the population have not benefited equally. Of particular concern are African Americans and persons with poor health care access, such as persons of low socio-economic status (SES) and/or with no health insurance. Of particular note is that stroke mortality rates, while declining rapidly since 1950 nationally,<sup>4</sup> have declined only slightly since 1990. This is also the case in Missouri.<sup>1</sup> Between 1990 and 2003, the percentage of Missouri's population over the age of 35 increased by five percent for men and four percent for women.<sup>5</sup> In 2003, 50% of the male population was over the age of 35, while 54% of the female population was over the age of 35. There was no change between 1990 and 2003 in the percentage of Missourians over the age of 65.<sup>5</sup>

There was also a shift in the racial and ethnic make-up of Missourians between 1990 and 2000, the year of the last census. In 1990, 87.7% of the population described themselves as white, 10.7% as African American, and 1.2% self-reported themselves of Hispanic ethnicity. In 2000, these numbers changed to 86.1% white, 11.2% African American, and 2.1% of Hispanic ethnicity. For Hispanics, this represents an increase of 75%.<sup>5</sup>

This plan was developed from 2004-2005 with input from over 40 internal and external partners. It will provide Missourians with the information they need to understand the burden of CVD in their state as well as the risk factors for heart disease and stroke. It describes strategies taking place throughout the state involving the Missouri Heart Disease and Stroke Prevention Program and its partners to address these risk factors.

A photograph of two women with short blonde hair, laughing joyfully. They are wearing light-colored, ribbed, short-sleeved shirts. The woman on the right is wearing a belt and has her hand resting on the shoulder of the woman on the left. The background is blurred.

# background

# Background

## Background

The Missouri Department of Health and Senior Services Cardiovascular Health Task Force developed the Missouri Heart Disease and Stroke Prevention Program's first strategic plan in 1991. The purpose of the plan was to raise awareness of the many life-threatening consequences of cardiovascular disease, and to develop a framework to plan and implement statewide cardiovascular health promotion activities and policies. The goals and objectives developed in the 1991 Plan were based largely on year 2000 objectives from "Healthy People 2000: National Health Promotion and Disease Prevention Objectives." They targeted a wide variety of CVD issues including coronary heart disease, stroke, cigarette smoking, environmental tobacco smoke exposure, high blood pressure, high blood cholesterol, diet and nutrition, physical inactivity, overweight/obesity, community-based programs, policy and legislation, local public health agency practice, physician practice, and surveillance and data collection.

In 2000 the *Missouri Cardiovascular Health Program* along with the support and guidance of the Cardiovascular Health Advisory Board developed the Missouri Cardiovascular Health State Plan. It was determined that the goals and objectives set in the 1991 Plan, with only a few exceptions, were still valid. Despite national trends showing positive changes, CVD unfortunately remained the primary killer across the U.S. and in Missouri. Efforts to address the goals set in the 1991 State Plan included programs to increase screening, referral, and follow-up for those individuals at risk for high blood pressure and high blood cholesterol levels. The then Missouri Department of Health supported such screening activities in the cities of St. Louis, Kansas City and southeastern Missouri, areas of the state with a high population of African Americans at increased risk for CVD.

As a result of this Cardiovascular Risk Reduction (CVRR) Program, education and screenings, referrals, and follow-up were implemented through community-based and church-based programs. Additionally, school-based programs were implemented as part of the CVRR program in the same three regions to reach the elementary children with nutrition education programs. Based on the high CVD mortality rate in Missouri, the state became eligible for and was awarded a Centers for Disease Control and Prevention (CDC) grant, which allowed the state to build the needed infrastructure for a statewide Cardiovascular Health Program. The staff that was added allowed the Program to focus on the establishment of community-based programs that address physical inactivity and unhealthy eating by changing the policies and environmental conditions inhibiting recommended health behaviors.

In 2002, the emphasis for the CDC grant moved from addressing physical activity and nutrition, two major risk factors for heart disease and stroke, to the prevention of initial and recurrent events, knowledge of the signs and symptoms of heart attack and stroke, and the control of high blood pressure and cholesterol. Since CDC does not allow its funding to be used for screenings or direct services to heart disease and stroke patients, partnering with contractors who can furnish these services, and evaluate their progress, has become vital to the Program.

Priority focus for fiscal year 2006 is on high blood pressure, high cholesterol, and secondary prevention in school, community, healthcare, and worksite settings. The Missouri Heart Disease and Stroke Prevention Program also works in collaboration with other Missouri Department of Health and Senior Services programs that address related chronic diseases or risk factors so that activities of these programs are not duplicated, but enhanced.

A warm-toned photograph of a woman with short blonde hair smiling and holding a baby. The woman is wearing a light-colored t-shirt and a small stud earring. The baby is wearing a white onesie. They are both looking towards the right side of the frame.

# burden of disease

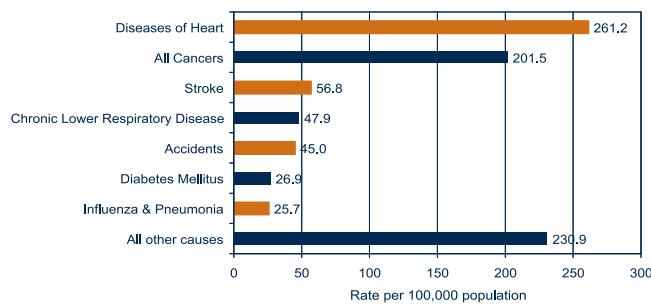
# Burden of Disease in Missouri

## Cardiovascular Disease Burden

Cardiovascular disease (CVD) pertains to conditions affecting the heart and blood vessels, including coronary heart disease, atherosclerosis, stroke, and high blood pressure. In Missouri, and the U.S., heart disease is the most common cause of death, with stroke the third leading cause of death (Figure 1).<sup>1,6</sup> Costs related to heart disease and stroke morbidity and mortality are staggering. Nationally, total costs for heart disease and stroke are estimated at \$394 billion for 2005.<sup>6</sup> This amount includes direct health expenditures (physician cost, hospital and nursing home services, cost of medications, and home health costs, etc.) and indirect costs such as lost productivity and activity limitations. In Missouri, hospitalization charges for heart disease and stroke were almost \$3.5 billion in 2003.<sup>1</sup>

Missouri continues to rank among the states with the highest CVD mortality rates. Missouri's heart disease mortality rate was 10th worst in the nation in 2002, while Missouri's stroke mortality rate was 13th worst in the nation in 2002.<sup>7</sup>

**Figure 1: Most Common Causes of Death, Missouri 2003**



Source: MICA<sup>1</sup>

## Risk Factor Prevalence

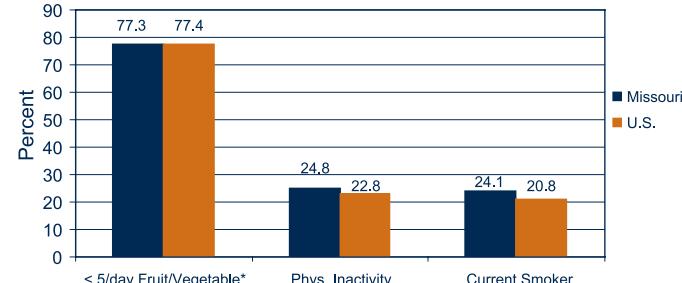
Behaviors, conditions or characteristics that increase the risk of developing CVD are called risk factors. CVD risk factors include:

- Modifiable risk factors: physical inactivity, poor nutritional habits, and smoking
- Conditions: high blood pressure, high blood cholesterol, diabetes, obesity, and uncontrolled stress
- Non-modifiable risk factors: age, family history, sex/gender, and race/ethnicity

Modifiable risk factors are lifestyle-based, meaning they can be changed through changes in health behavior. Conditions are influenced both by modifiable and non-modifiable risk factors, and in some cases, such as with high blood pressure, are also considered a disease. It has been suggested that CVD mortality could be reduced by 60% through control of CVD conditions, and healthy behavior to control modifiable CVD risk factors.<sup>8-12</sup>

Figure 2 shows the overall CVD modifiable risk factor prevalence rates for Missouri in 2004.<sup>13</sup> All prevalence rates are the same or higher than the U.S. average, putting Missouri adults at somewhat greater risk of developing CVD and/or CVD complications.

**Figure 2: Prevalence of Modifiable CVD Risk Factors, Missouri and United States**



\*5+/day servings of fruits and vegetables: 2003 U.S. and Missouri data

Source: BRFSS<sup>13</sup>

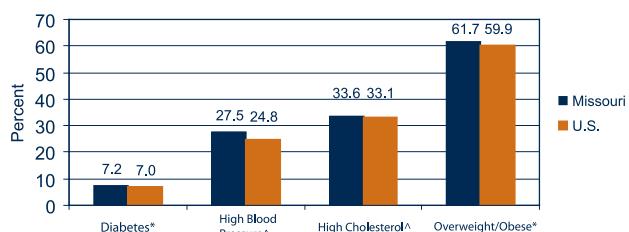
Physical activity levels affect all conditions and diseases associated with CVD. Exercising at least a moderate amount (such as 30 minutes of brisk walking) on most, if not all, days of the week promotes cardiovascular health (CVH). However, in 2004 almost one in every four Missouri adults (24.8%) was physically inactive,<sup>13</sup> meaning these individuals did not participate in any leisure time physical activity.

Eating a healthy diet affects all modifiable conditions and diseases associated with CVD. Consuming at least five servings of fruits and vegetables per day, and eating a diet low in saturated fat improves CVH.<sup>14</sup> However, in 2004 only 22.7% of Missouri adults reported eating at least five servings of fruits and vegetables per day.<sup>13</sup>

Missouri has one of the highest smoking prevalence rates in the United States. In 2004, 24.1% of Missouri adults were current smokers, compared to a U.S. rate of 20.8%. Smoking rates are higher among males than females. Smoking prevalence rates increase with lower income and educational levels, as well as with advancing age.<sup>13</sup>

Figure 3 shows the overall prevalence rates in Missouri for conditions that affect heart disease and stroke. The prevalence for diabetes is from the 2004 BRFSS, while the high blood pressure and high cholesterol prevalence rates are from the 2003 BRFSS. These prevalence rates are also somewhat higher than the U.S. average rate, most noticeably high blood pressure, adding to the increased risk of heart disease and stroke among Missouri adults.<sup>13</sup> When all modifiable risk factors are analyzed, two out of every three Missouri adults have at least one risk factor for CVD.<sup>15</sup>

**Figure 3: Prevalence of CVD Conditions, Missouri and United States**



\*Diabetes and Overweight/obese: 2004 data; High blood pressure and cholesterol: 2003 data  
Source: BRFSS<sup>13</sup>

High blood pressure (also called hypertension) is the leading risk factor for stroke, and a leading risk factor for heart disease. High blood pressure is a condition that is affected by

both modifiable and non-modifiable risk factors. In Missouri, there is variation in the prevalence of high blood pressure among adults based on demographic and socio-economic conditions.

In 2003, more than one in four Missouri adults (27.5%) had been told they have high blood pressure.<sup>13</sup> The prevalence of high blood pressure is higher among people with less education and/or at lower income levels. The prevalence of high blood pressure also increases with advancing age, with over half of the population over the age of 65 having high blood pressure (52.4%).<sup>13</sup>

High blood cholesterol, a leading risk factor for heart disease and stroke, is a condition that is also affected by modifiable and non-modifiable risk factors. In 2003, more than one in three Missouri adults (33.6%) over the age of 35 had been told their blood cholesterol was high.<sup>13</sup> As with high blood pressure, higher prevalence of high cholesterol is correlated with lower income and educational attainment. Similarly, the prevalence of high blood cholesterol increases with advancing age, with almost half of the population over the age of 65 having high blood cholesterol (47.5%).

Diabetes is a major co-morbid condition of heart disease and stroke. All three diseases share many of the same modifiable risk factors. Diabetes is affected by both modifiable and non-modifiable risk factors. In Missouri there is variation in the prevalence of high blood pressure among adults based on demographic and socio-economic conditions.

In 2004, 7.2% of Missouri adults over the age of 18 had been told by a health professional they had diabetes,<sup>13</sup> with higher prevalence found at lower income and lower education levels. Using the above prevalence rate, an estimated 300,175 Missouri adults had diabetes. The prevalence rate for diabetes increases to 15.7% for individuals over age 65 years.

Overweight and obesity are increasingly becoming one of the major public health issues in Missouri and is epidemic in the United States.<sup>16-19</sup> An individual who is overweight or obese increases his or her risk of developing high blood pressure, diabetes, heart disease or having a stroke. Though there can be a genetic influence on overweight and obesity, these risk factors are greatly influenced by an individual's level of physical activity and nutritional habits. The level of stress of an individual also influences the ability to control weight.<sup>20</sup>

### BMI Categories<sup>21</sup>

Normal Weight	Overweight	Obese
18.5-24.9	25.0-29.9	30.0+

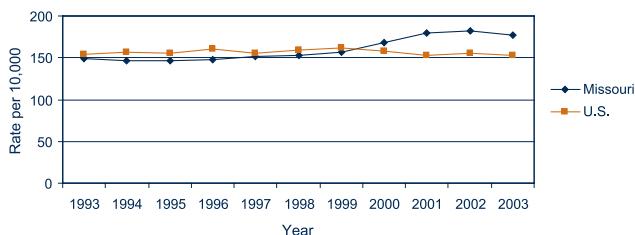
According to the 2004 BRFSS,<sup>13</sup> 35.8% of Missouri adults were overweight, and 24.2% of Missouri adults were obese. There is a small increasing trend in individuals defined as overweight based on increasing income, while there is a small decreasing trend in individuals defined as obese based on increasing income. These trends also hold when stratified by education.<sup>13</sup> Males are more likely to be overweight or obese than females. Whites are more likely to be overweight than African Americans, but African Americans are significantly more likely to be obese than whites.<sup>13</sup>

## Morbidity and Mortality

### Hospitalizations

Figure 4 shows the trend in inpatient hospitalizations in Missouri and the U.S. due to heart disease over the eleven-year period from 1993-2003. From 1993, the hospitalization rate remained relatively flat in the U.S., while the hospitalization rate in Missouri increased by 20%.<sup>1</sup> Prior to 2000, the U.S. hospitalization rate was higher than Missouri's. In subsequent years, Missouri's rate has been higher.

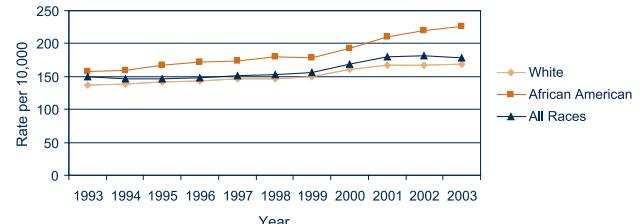
Figure 4: Age-Adjusted Hospitalization Rates for Heart Disease, Missouri and U.S., 1993-2003



Sources: MICA<sup>1</sup>, NCHS<sup>7</sup>

There were a total of 107,555 inpatient hospitalizations (177.7 per 10,000 population) in Missouri due to heart disease in 2003.<sup>1</sup> The age-adjusted hospitalization rate for whites was 169.2 per 10,000 and 225.4 for African Americans (Figure 5). Since 2000, hospitalization rates for African Americans have increased every year, while hospitalization rates for whites have remained relatively flat. Age-specific hospitalization rates in 2003 were higher for African Americans in every age category except for those age 85 and above.

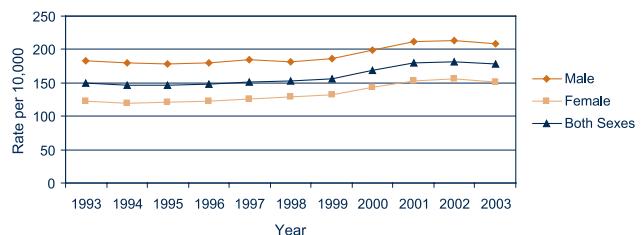
Figure 5: Age-Adjusted Hospitalization Rates for Heart Disease by Race, Missouri 1993-2003



Source: MICA<sup>1</sup>

Figure 6 shows the hospitalization rates in Missouri for the years 1993-2003 by sex. The age-adjusted hospitalization rate in Missouri for males was 209.3 per 10,000 in 2003 and 151.1 for females. As can be seen in Figure 6, the trends in hospitalization rates are similar for males and females.

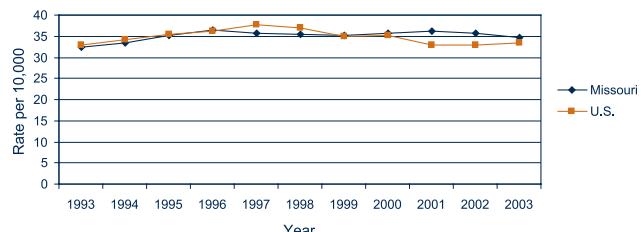
Figure 6: Age-Adjusted Hospitalization Rates for Heart Disease by Sex, Missouri 1993-2003



Source: MICA<sup>1</sup>

Figure 7 shows the trend in inpatient hospitalizations in Missouri and the U.S. due to stroke during the eleven-year period from 1993-2003. From 1993, the hospitalization rate remained relatively flat in Missouri and the U.S. The hospitalization rate in Missouri and the U.S. remained very close throughout all years reported in Figure 7.

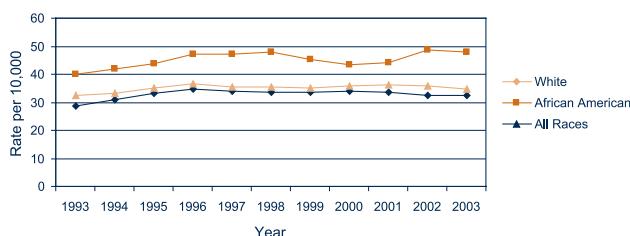
Figure 7: Age-Adjusted Hospitalization Rates for Stroke, Missouri and U.S., 1993-2003



Sources: MICA<sup>1</sup>, NCHS<sup>7</sup>

There were a total of 21,174 inpatient hospitalizations (34.7 per 10,000) due to stroke in 2003.<sup>1</sup> The age-adjusted stroke hospitalization rate for whites was 32.6 per 10,000 and 47.8 for African Americans (Figure 8). Prior to the year 2000, the disparity in hospitalization rates decreased. However, the disparity between African Americans and whites has increased in subsequent years. Age-specific hospitalization rates were higher for African Americans in all age categories except the 0-14 and 15-24 age groups.

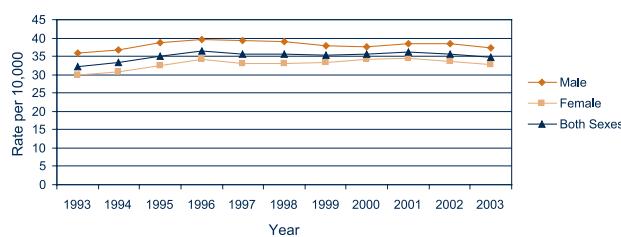
**Figure 8: Age-Adjusted Hospitalization Rates for Stroke by Race, Missouri 1993-2003**



Source: MICA<sup>1</sup>

Figure 9 shows the stroke hospitalization rates in Missouri for the years 1993-2003 by sex. The age-adjusted hospitalization rate in Missouri for males was 37.4 per 10,000 in 2003 and 32.7 for females. As shown in Figure 9, the trends in hospitalization rates are similar for males and females.

**Figure 9: Age-Adjusted Hospitalization Rates for Stroke by Sex, Missouri 1993-2003**

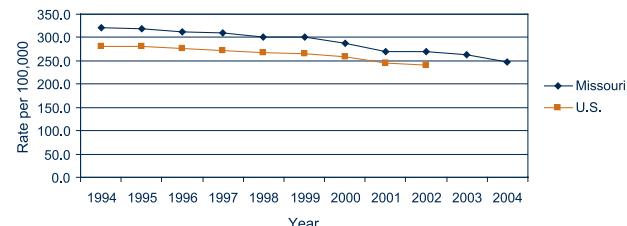


Source: MICA<sup>1</sup>

## Deaths

Figure 10 shows a comparison of death rates due to heart disease in Missouri and the U.S. During the period 1994-2004, the age-adjusted heart disease death rate decreased by 30% in Missouri, while during the period 1994-2002 the heart disease death rate in the U.S. decreased by 16%.<sup>1,7</sup>

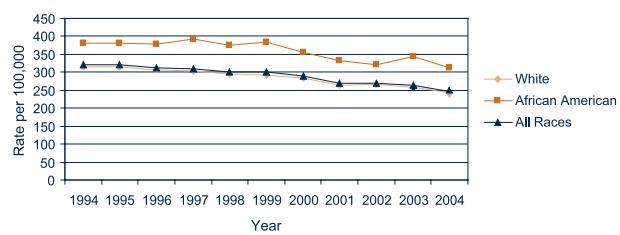
**Figure 10: Age-Adjusted Death Rates for Heart Disease, Missouri and U.S., 1994-2004**



Sources: MICA<sup>1</sup>, NCHS<sup>7</sup>

There were a total of 15,432 deaths in Missouri due to heart disease in 2004.<sup>1</sup> The age-adjusted death rate for whites was 242.3 per 100,000 and 312.3 for African Americans (Figure 11). For the time period 1994-2004, the death rate decreased by 31% for whites and 22% for African Americans (Figure 11). However, racial disparities in heart disease death rates were evident throughout the eleven-year period; in 2004, the African American death rate was 29% higher than the death rate for whites.

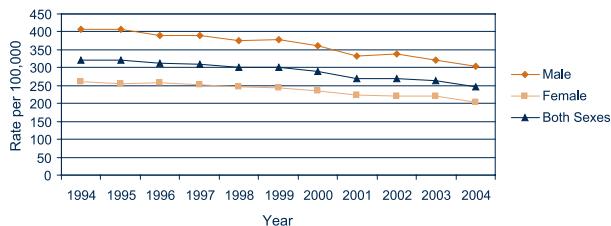
**Figure 11: Age-Adjusted Death Rates for Heart Disease by Race, Missouri 1994-2004**



Source: MICA<sup>1</sup>

Figure 12 shows the death rates in Missouri for the years 1994-2004 by sex. The age-adjusted death rate in Missouri for males was 302.8 per 100,000 in 2004 and 203.9 for females. During the eleven-year period 1994-2004, the death rate for males decreased by 35% and 28% for females (Figure 12). However, the disparity in rates between males and females persisted throughout the eleven-year period; in 2004, the male death rate was 49% higher than the death rate for females.

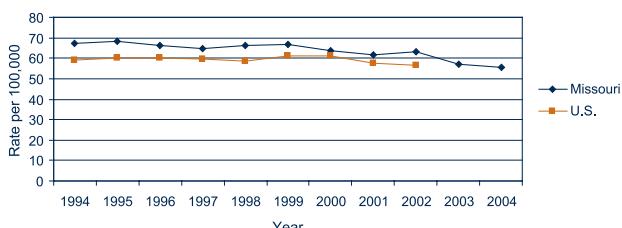
**Figure 12: Age-Adjusted Death Rates for Heart Disease by Sex, Missouri 1994-2004**



Source: MICA<sup>1</sup>

Figure 13 shows a comparison of death rates due to stroke in Missouri and the U.S. During the period 1994-2004 the age-adjusted stroke death rate has decreased by 17% in Missouri, while during the period 1994-2002 the stroke death rate in the U.S. remained relatively flat.<sup>1,7</sup>

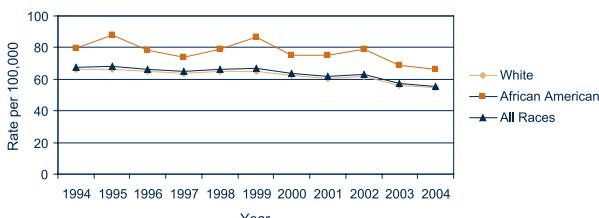
**Figure 13: Age-Adjusted Death Rates for Stroke, Missouri and U.S., 1994-2004**



Source: MICA<sup>1</sup>; NCHS<sup>7</sup>

There were a total of 3,483 deaths in Missouri due to stroke in 2004.<sup>1</sup> The age-adjusted death rate for whites was 54.9 per 100,000 and 66.0 for African Americans (Figure 14). For the period 1994-2004, the death rate decreased by 20% for whites and 21% for African Americans (Figure 14). As with heart disease, racial disparities in the death rate for stroke remained; the African American death rate in 2004 was 20% higher than the death rate for whites.

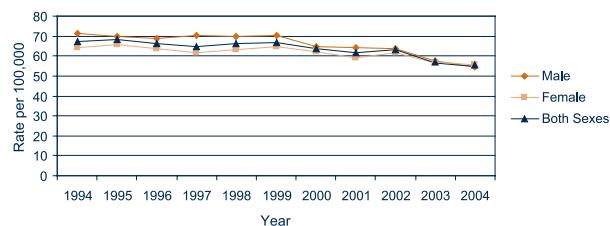
**Figure 14: Age-Adjusted Death Rates for Stroke by Race, Missouri 1994-2004**



Source: MICA<sup>1</sup>

Figure 15 shows the death rates in Missouri for the years 1994-2004 by sex. The age-adjusted death rate for males was 54.7 per 100,000 in Missouri in 2004 and 55.3 for females. For the period 1994-2004, the death rate for males has decreased by 30% and 17% for females (Figure 15). In 2004, the male death rate was lower than the female death rate for the first time in the eleven-year reporting period (Figure 15).

**Figure 15: Age-Adjusted Death Rates for Stroke by Sex, Missouri 1994-2004**



Source: MICA<sup>1</sup>

The burden of heart disease and stroke in Missouri remains high. Heart disease is the leading cause of death in Missouri regardless of race or sex, with stroke the third leading cause of death. Heart disease and stroke also are leading causes of morbidity in Missouri, and exact a staggering economic cost on the state and its citizens. However, data show that while hospitalizations due to heart disease and stroke increase, and costs associated with heart disease and stroke continue to increase, deaths due to heart disease and stroke continue to decrease. Despite the decreases in death rates due to heart disease and stroke, disparities due to race or sex remain.

# addressing disparities



# Addressing Disparities

## Addressing Disparities

The cardiovascular disease (CVD) mortality rate in Missouri differs by race, gender and, geographic location. African Americans have a significantly higher mortality rate than Caucasians. Men are at greater risk than women, though the gap is narrowing. The data for Missouri shows that in 2000 53.4% of Missouri's African American population lives in Kansas City, St. Louis, and the six county region known as the Missouri Bootheel. In addition, significant growth in the Hispanic population has occurred in these three sections of the state.<sup>5</sup> These three regions have been targeted to implement risk-reduction strategies associated with increased incidence of, and mortality rates from, CVD. Prevention strategies include controlling high blood pressure, controlling high cholesterol, knowing signs and symptoms of heart attack and stroke, calling 911, improving emergency response, and improving quality of care.

### Kansas City

According to the 2000 census, the population of Kansas City is 31.2% African American, accounting for 21.8% of the state's African American population.<sup>5</sup> The Kansas City Neighborhood and Community Services Department (KC-NCSD) through their Healthy Initiatives Project (HIP) has brought together 50 community and faith-based organizations to address health disparities associated with heart disease and stroke and their related risk factors. Intervention objectives target survivors of acute CVD to reduce the risk and disability from subsequent CVD events. The KC-NCSD is implementing a Barber/Beauty Shop Initiative, addressing barriers to detecting, managing, and controlling heart disease and stroke risk factors. Emphasis is aimed at identifying and controlling high blood pressure. In addition, KC-NCSD and HIP are partnering with the Kansas City REACH 2010's Chronic Disease Coalition in "Healthy Habits," a project that is encouraging citizens to practice healthy behaviors.

### St. Louis

The majority of the population in St. Louis city is African American (51%), accounting for 28.6% of Missouri's African American population. The Missouri Heart Disease and Stroke Prevention Program (MHDSP) is supporting programs to initiate community screenings with aggressive follow-up procedures. The City of St. Louis

Fire Department Community Awareness/Educational Campaign targets a 16zip code area in the St. Louis inner city area that has large economic and racial/ethnic disparities. Signs, symptoms, and risk factors of heart attack and stroke, and detection and management of high blood pressure are emphasized. Community CPR Training using the American Heart Association (AHA) "CPR for Family and Friends" curriculum is used to provide CPR training to community members, teach the detection and treatment of high blood pressure, recognize the signs and symptoms of heart attack and stroke, and the risk factors associated with each. The curriculum includes professional training for Emergency Service Personnel in recognizing signs, symptoms and risk factors for heart attack and stroke, rescue techniques for choking adults, CPR for adult, infants and children, an overview of the Chain of Survival, skills demonstrations, and practice sessions.

### Bootheel

The economy of the Missouri Bootheel lags behind the economy of the state as a whole and the poverty rate for this area is the highest within the state at 20.4%; African Americans make up 12% of the population of the Bootheel.<sup>5</sup> The Bootheel Task Force and the Community Coalitions Diabetes and Cardiovascular Initiative are administered through the University of Missouri Outreach and Extension (UOE). The UOE in collaboration with the MHDSP provide oversight, technical assistance and evaluation of educational activities related to increasing public awareness of the signs, symptoms and risk factors associated with heart disease and stroke, preventing recurrent events and complications of these diseases. Community capacity to conduct programs and activities related to secondary prevention are evaluated throughout the contract period. Coalitions and the task force promote CPR/AED training through the AHA and the American Red Cross. Coalitions and task forces are promoting community Automated External Defibrillator (AED) awareness to inform the public about what an AED is, how they are used in conjunction with CPR and where, if any, AED's are located in their respective communities. The MHDSP also continues to work closely with the Butler County Health Department, the lead public health agency for this area, and the other counties in the catchment area to address CDC's priority areas regarding heart disease and stroke prevention and control.

# risk factors



# Risk Factors

## Prevention and Management of Risk Factors

Promoting healthy lifestyles and reducing risk factors may produce the largest impact on healthier Missourians. A priority focus is being placed on prevention among African American men and women who suffer the greatest disparity in hypertension, high cholesterol, obesity, and diabetes. Strategies to improve the treatment of CVD are focused on comprehensive interventions in health systems, health communications, and community interventions. With early identification and detection of risk factors and disease, lifestyles can be modified and lives can be saved.

### Physical Inactivity

**Definition:** Individuals who are inactive report no leisure-time physical activity in the past 30 days. Individuals who are irregularly active report some moderate or vigorous activity, but are not regularly active. Individuals who are regularly active report either 5 or more days a week of physical activity for a total time of 150 minutes or more, or 3 or more days a week of vigorous activity for 20 minutes or more each session.

**Problem:** The lack of regular physical activity is a modifiable risk factor for cardiovascular disease, high blood pressure, stroke, and diabetes. Physically inactive and irregularly active lifestyles increased the risk of untimely deaths, unnecessary hospitalizations, hospital charges, and other personal and social burdens. (In 2004, 24.8% of Missouri adults were physically inactive—meaning they did not participate in any leisure time physical activity within the previous 30 days.)<sup>13</sup>

#### Actions:

- Provide education on the benefits of regular physical activity.
- Engage local programs to support physical activity outlets in communities.
- Establish community walking clubs.
- Create support in worksites to offer flextime for employees to engage in physical activity programs during the day.

- Conduct trainings for health care providers that support increased counseling, screenings, and referrals for physical activity programs.
- Provide adequate access to cardiac rehabilitation programs for those affected with heart disease.

### Unhealthy Eating Habits

**Definition:** Individuals with unhealthy eating habits are not following the Dietary Guidelines for Americans. Their average diet is inadequate in fruit and vegetable consumption, excessive in high fat food consumption, and they have an excessive intake of calories.

**Problem:** Unhealthy eating habits play an important role in increasing the risk of cardiovascular disease. A diet that is high in fat and cholesterol can cause a buildup of plaque in the arteries. The plaque slows down blood flow and blocks the arteries. If the blockage occurs in an artery that carries blood to the heart muscle, a heart attack can occur. Healthy eating involves eating the correct quantity and balance of foods from the major food groups. In Missouri in 2004, only 23% of the population ate the recommended 5 or more servings of fruits and vegetables daily.<sup>13</sup>

#### Actions:

- Support community and faith-based groups, schools and worksites to develop physical environments supportive of heart-healthy eating.
- Work with health care providers to develop a mechanism for referrals to nutrition programs for individuals diagnosed as overweight or obese.
- Partner with worksites to develop guidelines for vending machine content.

### Tobacco Use

**Definition:** Tobacco use includes any form of cigarette smoking, pipe smoking, chewing tobacco, or snuff. All of these forms contain nicotine, which contributes to the deadly effects of tobacco use.

**Problem:** Nicotine narrows or blocks the arteries traveling to and from the heart, thereby reducing the oxygen supply to the heart. Tobacco use increases the plaque build up in the arteries that further reduces blood flow. Decreases in blood flow lead to hypertension and other forms of cardiovascular disease. In 2004, 24.1% of Missourians smoked.<sup>13</sup>

#### **Actions:**

- Provide support to partners in raising the awareness of the general public and policy makers that an increase in tobacco product prices will decrease initiation and use in youth and decrease use in adults.
- Encourage local community groups, schools and worksites to establish tobacco-free environments.
- Work with community groups, health care providers, schools and worksites to provide support and cessation resources and programs.
- Collaborate with health insurance companies to offer lower-cost insurance for non-smokers and coverage for cessation programs.
- Partner with community groups, health care providers, schools and worksites to establish clean indoor air policies.

### **High Blood Pressure**

**Definition:** Blood pressure is caused by the pumping of blood from the heart into the arteries. It is a measure of how hard the heart has to work to pump the blood. Systolic pressure, the top number, is the higher pressure and is measured when your heart contracts, or beats. Diastolic pressure is the bottom number. It is the lower pressure and occurs when the heart is relaxed and refilling between beats. A reading of more than 140/90 mm Hg is considered high.

**Problem:** High blood pressure (hypertension) is caused when a buildup of cholesterol plaque and calcium occurs in the coronary arteries. Due to the buildup, the heart has to work harder in order to pump blood through the arteries. The extra pressure puts added force against the artery walls, which over time, damages them. The damaged arteries cannot deliver enough oxygen to other parts of the body. High blood pressure has been called the "Silent Killer" because it usually does not cause any symptoms and when left unchecked, can damage organs and cause: heart failure, strokes, heart attacks, kidney damage and blindness. In 2003, 27.5% of Missouri adults were informed they had high blood pressure.<sup>13</sup>

#### **Actions:**

- Ensure that screenings are accessible (convenient location, sufficient hours of business, culturally competent staff, and adequate transportation to and from screening).
- Disseminate standardized protocols for assessment, interpretation of results, and referral.
- Establish a mechanism by which appropriate follow-up support will be made available at screening sites.
- Work with Medicaid, pharmaceutical companies, health care plan and health care providers to address the issue of health literacy and explore opportunities to simplify processes, forms and informational brochures.

### **Elevated Cholesterol**

**Definition:** Cholesterol is an essential component in the structure of cells and is also involved in the formation of important hormones. It is produced by the liver, which provides all the cholesterol an individual needs. Excess cholesterol in the bloodstream can form plaque on artery walls that narrows arteries and reduces blood flow to the heart.

**Problem:** A high level of cholesterol in the blood increases the risk of CVD. The build up of plaque and the narrowing of arteries can lead to chest pain, and if left untreated, can eventually lead to a heart attack. In 2003, 35.6% of Missouri adults over the age of 35 were informed their blood cholesterol was high.<sup>13</sup>

#### **Actions:**

- Work with partners to provide affordable and accessible screening opportunities (convenient location, sufficient hours of business, culturally competent staff, and adequate transportation to and from screening) and follow-up support.
- Develop culturally appropriate, reader-friendly material about cholesterol and the link to heart disease.
- Develop educational/community awareness campaign on the importance of obtaining blood cholesterol screenings.

### **Obesity**

**Definition:** Obesity and overweight are determined by Body Mass Index (BMI) (weight in kilograms divided by height in meters squared). To estimate BMI using pounds and inches, use: [weight (pounds) divided by height (inches)  $\times 703$ ]. Individuals are

considered obese if their BMI is 30 or greater and overweight if their BMI is between 25 and 29.9.<sup>21</sup>

**Problem:** Overweight and obesity are of epidemic proportions in Missouri occurring among half of the adult population. Based on the BMI in 2004, 60.1% of Missourians were considered overweight and obese.<sup>13</sup> In children, obesity rates have doubled over the last ten years. Obesity is strongly associated with Type 2 diabetes, heart disease, high blood pressure, stroke, some cancers, and a wide range of other diseases affecting Missouri citizens. Missouri's minority populations (African Americans, Hispanics, and Native Americans) experience extremely high rates of overweight and obesity.

#### **Actions:**

- Encourage the school environment to utilize existing resources that support increased physical activity and healthy nutrition.
- Engage worksites to offer employees healthy food options and opportunities for physical activity.
- Work with healthcare plan providers to provide coverage to plan enrollees for prevention and treatment of obesity.
- Collaborate with community organizations, faith-based programs and other community groups to provide culturally-appropriate programs on physical activity and nutrition.
- Work with the media, schools, worksites, communities and healthcare providers to ensure the messages regarding physical activity and healthy nutrition are consistent.

#### **Diabetes**

**Definition:** Diabetes is a medical condition in which the body either does not produce insulin or does not properly use insulin. Insulin is a hormone that converts sugars and starches into energy for daily living. There are main categories of diabetes: Type 1 and

Type 2. Type 1 diabetes is a disease that prohibits the body from producing insulin. Type 1 affects mostly children and adolescents and comprises approximately 5 to 10 percent of all diabetes cases. Type 2 diabetes is a metabolic disease affecting the body's ability to produce any or enough insulin. The prevalence of Type 2 diabetes is nearing epidemic proportions and comprises approximately 90 to 95 percent of all diabetes cases.

**Problem:** The connection between CVD and diabetes can be life threatening. Diabetes changes the chemical makeup of some of the substances in the blood, which causes the blood vessels to thicken or clog up completely. The impaired blood flow carries fewer nutrients to the body's organs resulting in a variety of complications that include blindness, kidney disease, nerve disease and amputations, heart disease and stroke, high blood pressure, dental disease, and impotence. Diabetes is the fifth leading cause of death in Missouri.<sup>1</sup> In 2004, 7.2% of Missouri adults were informed by a health care professional that they had diabetes.<sup>13</sup> It accounts for 14% of all hospitalizations, and the total hospital charges in 2003 for diabetes was \$147 million.<sup>1</sup> The prevalence of diabetes in Missouri is 1.4 times higher for the non-white population (10%) vs. 7.1% among the white population.<sup>13</sup>

#### **Actions:**

- Create and disseminate public awareness campaigns about the link between diabetes and CVD.
- Provide technical assistance to communities, worksites and healthcare providers regarding the relationship between diabetes and CVD.
- Promote CVD standards of care (including those related to diabetes).
- Build partnerships with medical/nursing schools and medical/nursing associations to provide educational training on CVD and the relationship with other chronic diseases (including diabetes).
- Work with other state initiatives, health systems and organizations to promote consistent, culturally appropriate messages regarding CVD and other chronic diseases (including diabetes).

# goals and objectives

# Goals and Objectives

## Goals and Objectives

### Goal 1: Prevention of Risk Factors

**Objective 1:** By 2010, Missourians will improve the baseline of healthy behaviors by 10%. Healthy behaviors include being physically active, avoiding tobacco use, and adopting heart-healthy nutritional habits to prevent heart disease and stroke.

**Baseline:** Current smoking: 24.1%, (2004 BRFSS); Physically Inactive [sedentary]: 24.8%, (2004 BRFSS); 5 or more daily servings of fruits and vegetables: 22.7%, (2004 BRFSS).

#### Actions:

- Partner with MU Extension to provide technical assistance with community coalitions as they plan/implement risk factor intervention/awareness education.
- Partner with Tobacco Control Program to enhance/establish local policies regarding clean indoor air.
- Partner with the Missouri School-Age Children's Health Services Program's contractors to collect data on health and wellness of staff.
- Assist churches, neighborhoods, and/or communities in 40% of Missouri counties to address primary and/or secondary prevention of heart disease and stroke.
- Provide technical assistance to three Parks and Recreation Departments on the Hearts N' Parks Program.
- Collect data on heart disease and stroke risk factors to define burden and trends in cardiovascular disease (CVD) based on BRFSS module schedule.

**Potential Partners:** Bureau of Health Promotion's Chronic Disease Primary Prevention contractors; Tobacco Control Program; Nutrition and Physical Activity Program, Missouri Coordinated School Health Coalition; Missouri Parks and Recreation Association (MPRA); Missouri Department of Elementary and Secondary Education (DESE); Bureau of Child Care; faith groups; community groups; parish nurse organizations; MU Extension

**Objective 2:** By December 2006, identify and list issues/barriers to worksite health promotion related to heart disease and stroke that have been identified as a result of worksite projects.

**Baseline:** Developmental-0 (2006)

#### Actions:

- Partner with Lead Agencies to provide 12-month follow-up evaluations to businesses that complete the worksite survey.
- Partner with the Mid-America Coalition to conduct the worksite project in the Kansas City area.
- Disseminate the worksite survey report to all project partners.
- Write recommendations to address issues uncovered by the survey report.
- Finalize and distribute to partners a report on worksite project data for primary and secondary prevention of heart disease and stroke.

**Potential Partners:** Lead Agencies; LPHAs within the Lead Agency's catchment area; worksites; DHSS staff; Kansas City area worksites

**Objective 3:** By 2007, collaborate with at least two partners per year to implement projects that target improving a patient's understanding of what questions to ask their health care providers in order to better understand their personal risk for heart attack and stroke. By 2010, increase that to four partners per year.

**Baseline:** Developmental-0 (2006)

#### Actions:

- Present on heart and stroke literacy during one DHSS Grand Round.
- Promote patient awareness initiatives to be used as a resource tool for Missouri

residents over the age of 18.

- Promote medical and nursing school classroom presentations that encourage clinicians to offer information to better assist patient's understanding of their own personal risks for heart attack and stroke.
- Promote train-the-trainer workshops, educational sessions, and cardiovascular screenings in beauty salons and barbershops.
- Collaborate with other Bureau of Cancer and Chronic Disease Control (CCDC) programs promoting advocacy training about the need for health literacy regarding heart disease and stroke.

**Potential Partners:** Missouri medical and nursing schools; Missouri Society of Public Health Educators

## Goal 2: Detection and Treatment of Risk Factors

**Objective 1:** By 2010, the percentage of adult Missourians who obtain appropriate screening with follow-up for:

- 1a. blood pressure
- 1b. blood cholesterol (total cholesterol, HDL, LDL)
- 1c. blood sugar levels in at-risk populations will increase

**Baseline:** Blood Pressure-Developmental; Cholesterol-74.3% (HEDIS 2004) and 76.4% (BRFSS 2003); St. Louis Fire Department- 2,771 (FY 2004); Kansas City Neighborhood and Community Services-0; blood sugar-developmental

### Actions:

- Collaborate with partners to make available to adult Missourians at convenient times and locations and with little or no cost screenings for:
  - 1a. blood pressure
  - 1b. blood cholesterol (total cholesterol, HDL, LDL)
  - 1c. blood sugar levels
- Identify barriers for screening through regular medical providers and viable alternatives to assure that uninsured have access to health appraisals and follow-up care.
- Partner to assure convenient and affordable screening opportunities for blood pressure for clients at federally qualified health centers (FQHCs) are offered.
- Mobilize and/or enhance partnerships with community organizations, churches, and other organizations and/or partners with an interest in improving chronic disease risk factors.

**Potential Partners:** St. Louis Fire Department; KC Neighborhood and Community; FQHCs; Deaconess Parish Nurses; St. Luke's Parish Nurses; Lead Agencies; American Heart Association (AHA); National Kidney Foundation; parish nurses; faith-based organizations; Racial and Ethnic Approaches to Community Health (REACH); Missouri State Medical Association (MSMA); Missouri Association of Osteopathic Physicians and Surgeons (MAOPS); Missouri Nurses Association (MONA); Missouri Primary Care Association (MPCA); and other professional organizations

**Objective 2:** By 2010, reduce the percent of individuals with diabetes in the FQHC Diabetes Registries that have uncontrolled high blood pressure and high cholesterol by 10%. (FQHC Diabetes Registries)

**Baseline:** Uncontrolled high blood pressure-62.2% (2005); uncontrolled high cholesterol-50.5% (2005)

### Actions:

- Partner with MPCA and the MDPCP to heighten awareness of the connection between diabetes, heart disease and stroke.
- Participate in the building of the Statewide Diabetes Essential Public Health System.
- Support quality improvement through on-going technical and financial support of Missouri's FQHCs participating in the National Diabetes and/or Cardiovascular Collaboratives.

**Potential Partners:** Missouri Diabetes Prevention and Control Program (MDPCP); MPCA; FQHCs

**Objective 3:** By 2010, 70% of clients with CVD and/or diabetes at FQHCs with registries statewide will have documented chronic disease self-management goals that are reviewed every six months with trained staff members. (FQHC Diabetes and CVD Registries)

**Baseline:** Diabetes-50.9% (2005); CVD-45.3% (2005)

### Actions:

- Partner with MPCA to offer trainings and technical assistance to FQHC medical staff on the importance of creating and updating chronic disease self-management goals.
- Conduct an evaluation of client's self-management goals in the FQHCs that address chronic disease prevention and management.

**Potential Partners:** MPCA; FQHCs; MDPCP

**Objective 4:** By 2010, 10% of insurance payers will have policies in place that encourage and reimburse cholesterol screenings. (HEDIS)

**Baseline:** Developmental-0 (2006)

**Actions:**

- Create and administer a survey to determine how many insurance payers are currently reimbursing for cholesterol screenings.
- Evaluate the project and the number of payers that are reimbursing for cholesterol screenings.
- Establish key strategies to work with employers (purchasers) and health plans on reimbursement policies for cholesterol screenings and other key preventative practices.
- Conduct and evaluate the effectiveness of the project and the rise, if any, in the number of payers that began reimbursing for cholesterol screenings.

**Potential Partners:** MPCA; managed care and other health insurance companies; Department of Social Services (Medicaid); Primaris

**Objective 5:** By 2007, offer two training opportunities per year for health care providers on best practices in regard to the detection, treatment, and management of heart disease and stroke and their risk factors. By 2010, increase that to four per year.

**Baseline:** Developmental-0 (2006)

**Actions:**

- Encourage medical and nursing schools to incorporate best practices into training curriculums.
- Partner with the Office of Primary Care and Rural Health to provide training to rural physicians regarding consensus guidelines and how to apply the chronic care model in rural settings.
- Collect data to determine the number of health care providers using consensus guidelines for heart disease.

**Potential Partners:** Missouri Academy of Family Physicians (MAFP); MAOPS; MPCA; Nurse Practitioner arm of the MONA; Missouri Hospital Association (MHA); medical and nursing schools

**Objective 6:** By 2007, provide technical assistance and resources to at least two community partners per year that will expand successful programs related to Missouri residents knowing their blood pressure, cholesterol, blood sugar numbers, or how to access programs to help manage/control high values. By 2010, increase to four communities.

**Baseline:** Developmental-0 (2006)

**Actions:**

- Conduct pilot in two communities in 2006.
- Partner with Lead Agencies to advocate for worksites to offer screening programs and disease management programs for their employees.
- Partner with the Missouri School Age-Children's Health Services Program (MSCHSP) to incorporate secondary prevention education into the staff wellness portion of the program.
- Partner with faith and community organizations through Kansas City Healthy Initiatives Project (HIP); Kansas City Chronic Disease Coalition (KCCDC); Deaconess Parish Nurses; Heart Health Coalitions; MPRA; MU Extension; and others to incorporate consumer education into existing and new community programs.
- Partner with Kansas City Quality Improvement consortium (KC-QIC) in the development of a consumer brochure series that is the lay version of the guidelines for diabetes, congestive heart failure, and hypertension developed by KC-QIC.
- Partner to assure screenings and/or awareness education are provided to the uninsured and priority populations at highest risk for cardiovascular disease in St. Louis, Kansas City and Southeast Missouri.
- Provide training and technical assistance in regard to, primary and secondary prevention of heart disease and stroke to schools participating in the MSCHSP.
- Partner with the Coordinated School Health Coalition to provide training and technical assistance to school professionals regarding primary and secondary prevention of heart disease and stroke. Identify barriers for priority populations to obtain early detection and treatment of cardiovascular disease.

- Identify barriers for priority populations to obtain early detection and treatment of heart disease.

**Potential Partners:** MSCHSP; MPRA; faith and community organizations through Kansas City (HIP); KCCDC; Deaconess Parish Nurses; Heart Health Coalitions, KC-QIC; Lead Agencies, WIC providers, Area Agencies on Aging (AAA's); Missouri Dietetic Association (MDA); MU Extension

**Objective 7:** By 2007, increase the number of FQHCs from 5 to 10 who expand from diabetes by adding CVD and have developed registries to track patient progress. By 2010, increase to 15.

**Baseline:** 5 Centers in 2005

**Actions:**

- Partner with MDPCP and MPCA to create a heart disease, stroke, and diabetes data collection system.
- Provide financial support for quality improvement of Missouri FQHC's participating in the National Diabetes and Cardiovascular Collaboratives.
- Provide technical assistance to FQHCs expanding to cardiovascular disease.

**Potential Partners:** MPCA; MDPCP; Community Health Centers (FQHCs across the state)

**Objective 8:** By 2007, the percentage of adult Missourians who have high blood pressure that is under control will increase from 54% in 2003 to 60%. (HEDIS) By 2010, increase to 62%.

**Baseline:** 54% (2003)

**Actions:**

- Partner to promote awareness campaigns for hypertension control.
- Partner with managed care organizations, Medicaid, Primaris, physician organizations, nurse organizations to increase the number of programs that assist individuals with controlling high blood pressure.
- Partner with American Association of Retired Persons (AARP); AAA's; physician

assistant organizations; and physicians who primarily serve high-risk groups such as the African American community to increase screening and follow-up opportunities.

- Partner to utilize existing infrastructure and resources to promote treatment guidelines (NHLBI or national standard), and patient education to improve compliance with physician recommendations.
- Collaborate with partners to encourage linking of individuals to the services they need.
- Provide educational materials to providers for awareness programs.
- Survey insurance payers to evaluate the implementation of best practices upon member's diagnosis of high blood pressure.
- Partner with community coalitions to provide technical assistance on the implementation of programs to address the importance of controlling high blood pressure.

**Potential Partners:** Managed care organizations; Medicaid; Primaris; physician organizations; nurse organizations; American Association of Retired Persons (AARP); AAA's; physician assistant organizations; physicians; MU Extension; FQHCs; Sister-to-Sister Foundation; lead agencies

**Objective 9:** By 2007, the percentage of adult Missourians who have high cholesterol that is under control will increase from 55% in 2003 to 60%. (HEDIS) By 2010, increase to 62%.

**Baseline:** 55% (2003)

**Actions:**

- Partner to promote awareness campaigns for knowing cholesterol numbers.
- Partner with managed care organizations, Medicaid, Primaris, physician organizations, nurse organizations and barber/beauty shops to increase the number of programs that assist individuals with controlling high blood pressure.
- Provide educational materials to providers for awareness programs.
- Partner with community coalitions to provide technical assistance on the implementation of programs to address the importance of controlling high cholesterol.

**Potential Partners:** Managed care organizations; Medicaid; Primaris; physician organizations; nurse organizations; AARP; AAA's; physician assistant organizations;

physicians; MU Extension; FQHCs; Barber/Beauty shops; Sister-to-Sister Foundation; Lead agencies

### Goal 3: Early Identification of Heart Attacks and Stroke

**Objective 1:** By 2010, the number of awareness/educational campaigns for the public in regard to recognizing signs and symptoms of heart attack and stroke and the importance of calling 911 or other emergency number in their community will increase from 0 to 30.

**Baseline:** 0 (2006)

#### Actions:

- Partner with faith-based and community organizations to conduct community awareness/educational signs and symptoms campaigns.
- Identify and promote promising programs/campaign materials on heart attack and stroke signs/symptoms such as Act in Time and AHA – Stroke: When Minutes Matter.
- Assist community coalitions in planning/implementing awareness activities.
- Monitor emergency room data regarding heart attack and stroke patients.
- Promote worksite stroke awareness projects.

**Potential Partners:** Faith-based and community organizations; parish nurses; drug stores; media; managed care; Medicare; Medicaid; parks and recreation agencies; schools; Deaconess Parish Nurses; MSCHSP; American Heart Association; MU Extension; nurses associations; Lead Agencies; worksites; hospitals

**Objective 2:** By 2010, the number of Automatic External Defibrillators (AEDs) placed by the Office of Primary Care and Rural Health will increase from 160 in 2005 to 500. (Office of Primary Care and Rural Health)

**Baseline:** 160 (2005-Office of Primary Care and Rural Health)

#### Actions:

- Partner with the Office of Primary Care and Rural Health on the placement of AEDs and training opportunities for first responders with emphasis on rural areas where response time is slower.
- Partner with the Office of Primary Care and Rural Health, Lead Agencies, Missouri

Emergency Medical Services (EMS) Association, EMS agencies, and other community organizations on the enhancement of an AED registry.

- Partner with school, worksite, community, and health care settings to determine if a Public Access Defibrillator (PAD) Program is needed.
- Promote the development of AED registries in each Lead Agency county.

**Potential Partners:** Office of Primary Care and Rural Health; Missouri EMS Association; EMS agencies; community organizations; schools, worksite, community, and health care settings; Lead Agencies

**Objective 3:** By 2008, the number of AEDs available in public schools served by the MSCHSP will increase from 0 to 100. By 2010, increase to 125.

**Baseline:** 0 (MSCHSP-2005)

#### Actions:

- Partner with the MSCHSP to determine the number of AEDs currently available in schools served by their program.
- Partner with the MSCHSP and LPHAs to provide training to school nurses on use of AEDs.

**Potential Partners:** MSCHSP; AED Manufacturers; LPHAs

**Objective 4:** By August 2006, establish a baseline of the number of persons who receive CPR training in schools served by the MSCHSP and the worksites assessed by the LPHAs. By 2010, increase that percentage by 10%.

**Baseline:** 0 (2006)

#### Actions:

- Partner with the MSCHSP to obtain data on CPR training in schools.
- Partner with the MSCHSP and LPHAs to increase the number of convenient and affordable opportunities for CPR training.

**Potential Partners:** MSCHSP; LPHAs; worksites; Red Cross CPR Instructors

**Objective 5:** By 2010, increase the availability of 911 systems to all 115 counties in the state of Missouri.

**Baseline:** 82 in 2004 (Information Security Management, State of Missouri, Office of Administration)

**Actions:**

- Partner with the AHA Advocacy Committee, Missouri EMS Association, DHSS Unit of EMS to advocate for statewide 911 accesses, legislators, local politicians, Health Boards, LPHAs.
- Support public policy initiatives to enhance 911 services through cellular telephones (E911).
- Partner with the AHA to alert heart disease and stroke professional contacts, with information regarding upcoming policy/legislation that supports heart disease and stroke.
- Partner with the AHA, Missouri EMS Association, DHSS Unit of EMS to advocate for cell phone 911 access.

**Potential Partners:** AHA Advocacy Committee; Missouri EMS Association; DHSS Unit of EMS; Legislators; local politicians; Health Boards; LPHAs; Emergency Numbering Association; Telecommunications industry

**Objective 6:** By 2010, increase from 0 to 3, the number of assessments that help identify the capacity of the acute stroke system in Missouri and use the information to create tools to assist system development.

**Baseline:** 0

**Actions:**

- Increase from 0 to 3 the number of stroke system surveys that help identify and monitor the strengths and gaps in Missouri's acute stroke system.
- Partner with the Stroke Committee, MHA, and other stroke system members to plan the surveys.
- Use the survey data and other information to produce tools to improve the acute stroke treatment system in Missouri.
- Formulate an aggregate data report to identify system gaps/issues and create further plans to improve the acute stroke treatment system in Missouri.

**Potential Partners:** Stroke Committee; AHA; MHA; EMS; Missouri hospitals

---

## Goal 4: Prevention of Recurrent Cardiovascular Events

**Objective 1:** By December 2006, MHDSP, collaborating with the MHDSP Stroke Committee, will create an Acute Stroke System Development Plan that includes priority recommendations and measurable objectives to improve the acute stroke treatment system in Missouri.

**Baseline:** Developmental—0 in 2005

**Actions:**

- Facilitate semi-annual MHDSP Stroke Committee meetings.
- Provide technical assistance as the Stroke Committee identifies stroke system development issues and recommends program activities.
- Provide updates to the Stroke Committee regarding MHDSP activities related to stroke.
- Provide updates to the Advisory Board, regarding the Stroke Committee, when applicable.
- Add new Stroke Committee members and partners as needed.

**Potential Partners:** MHDSP Stroke Committee; MHDSP Advisory Board

**Objective 2:** By 2010, increase the number of partners that provide stroke signs/symptoms awareness projects from 2 to 10.

**Baseline:** 2 in 2005

**Actions:**

- Collaborate with partners to increase stroke awareness initiatives and projects.
- As funds are available, consider contracts to enhance collaborations.
- Provide technical assistance to existing coalitions, task forces, contractors, and other stroke system members as they plan or implement stroke awareness projects or initiatives.

**Potential Partners:** LPHAs; AHA; NSA; acute stroke health care and health service providers and other stroke system members.

**Objective 3:** By December 2006, identify a baseline number of heart/stroke community education opportunities that stress prevention of recurrent heart attack or stroke events and were conducted with MHDSP collaboration or partnering during one year. By 2008, increase that number by 5%.

**Baseline:** Developmental-0 (2006)

**Actions:**

- Develop and conduct survey of MHDSP partners to identify baseline number of community education events that were conducted as a result of MHDSP collaboration and/or partnering during the year.
- Partner with MHDSP Advisory Committee to increase number of community education events.
- Make materials available for events by updating and reordering material for the DHSS warehouse.
- Provide technical assistance for events.

**Potential Partners:** MHDSP Advisory Committee; AHA; American Stroke Association (ASA); LPHAs; Heart Attack and Stroke Survivor Support Groups; worksites; Lead Agencies

---

## Goal 5: Infrastructure, Policy Development and System Change

**Objective 1:** By June 2007, build infrastructure at the state and local level to address cardiovascular issues.

**Actions:**

- Hold at least one meeting per year for lead agency staff.
- Provide opportunities for all MHDSP professional staff to attend at least one professional development workshop or conference per year.
- Revise and update as needed the Missouri Cardiovascular Strategic Plan.
- Annually, review and update MHDSP fact sheets
- Share with partners' progress toward achieving HP2010 goals and objectives addressed in the Missouri Cardiovascular Strategic Plan.
- Collaborate with other units at DHSS to provide trainings to increase knowledge of signs and symptoms of heart disease and stroke.

- Continuously review and evaluate literature to best practices and share information with partners.
- Identify new partners and create new working groups to focus on women and heart disease.

**Objective 2:** By June 2007, MHDSP staff will continue to attend and /or facilitate meetings with partners.

**Actions:**

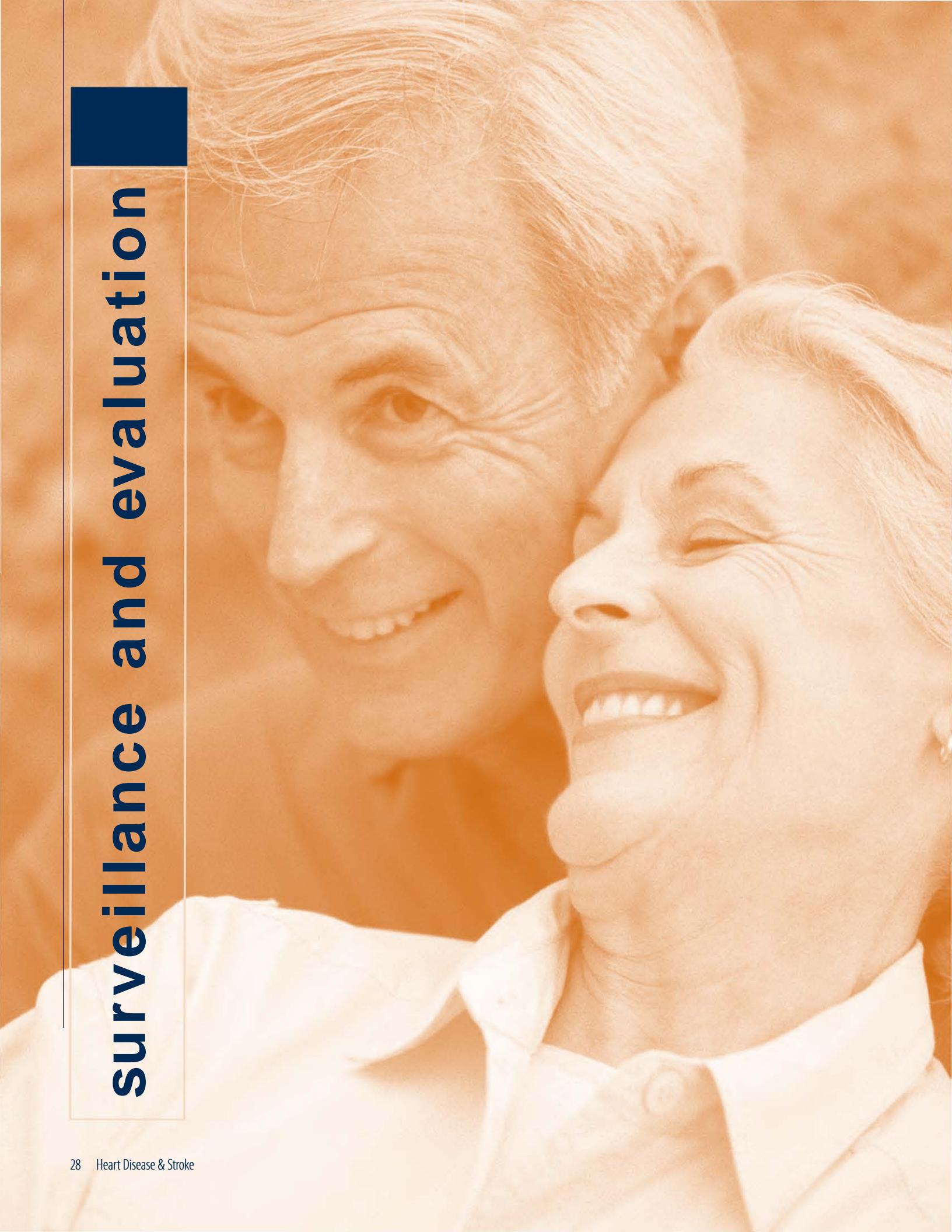
- Facilitate at least semi-annual MHDSP Advisory Board meetings.
- Facilitate at least semi-annual Stroke Committee meetings
- Attend and participate in REACH oversight meetings.
- Attend and participate in quarterly MPCA meetings.
- Attend Kansas City Neighborhood and Community Services monthly meetings.
- Participate as a board member of the Missouri WISEWOMAN project.
- Participate as a board member of the Missouri Diabetes Advisory Board.
- Attend the St. Louis Healthy Heart Coalitions bi-monthly meetings.
- Participate on the Planning Committee for the Sister-to-Sister Foundation Women's Heart Day Event.
- Participate in the AHA Metro St. Louis Multi-Cultural Health Initiative.

**Objective 3:** By June 2007, continue to provide support for community coalitions as they plan, implement, and evaluate activities targeting diabetes, cardiovascular disease and stroke.

**Actions:**

- Partner with the Tri-County Task Force to provide financial support and technical assistance to community coalitions in the Tri-County area.
- Partner with AHA/ASA to provide technical assistance to stroke coalitions.

# surveillance and evaluation



# Surveillance and Evaluation

## Surveillance

The MHDSP works with partners throughout DHSS to provide necessary comprehensive surveillance data for assessing and monitoring the cardiovascular health of populations and for program planning and assessment of program outcomes. A wide variety of surveillance mechanisms exist within DHSS. Morbidity and mortality trends for heart disease and stroke, and prevalence trends of heart disease and stroke risk factors such as hypertension, high cholesterol, physical inactivity, diet and tobacco use are available.

The Center for Health Information Management and Evaluation (CHIME) created the interactive database MICA (Missouri Information for Community Assessment), which synthesizes vital statistics, hospitalization and health behavior data. These data can be presented according to sex, race/ethnicity, age, insurance status, county and zip code. Data can also be presented for a single year or for every year since 1990. The MHDSP also works with CHIME for specific surveillance data needs that are not available electronically through MICA.

Missouri morbidity and mortality records from MICA, and health behavior data from the BRFSS (Behavioral Risk Factor Surveillance System) are used by the MHDSP to provide guidance for the development of work plan objectives, develop projections, and evaluate the impact of program activities.

## Evaluation Plan

The evaluation plan for the Missouri Heart Disease and Stroke Prevention Program's (MHDSP) strategic plan will consist of two (2) components: 1) a discussion of evaluation strategy for process, intermediate and impact evaluation of MHDSP programs; and 2) a tabular summary of established indicators, current data sources available to address those indicators at the state level (regional, county, or local level if possible), and the current status of each indicator. Results of these indicators will demonstrate the impact of MHDSP activities at the local and population levels.

To the extent possible, the evaluation plan utilizes existing sources of data to minimize expense and maximize the resources available to address activity-level evaluations. When data sources are not currently available to address an indicator, that gap is noted in the table. The MHDSP evaluation staff continually work with internal and external partners to discuss potential methods to assess goal achievement in such cases.

This evaluation plan should be seen as a living document, subject to change based on the achievement of goals, change in program strategy, and/or the presentation of new opportunities.

# Evaluation Plan

<b>Goal/Objective</b>	<b>Indicator</b>	<b>Data Source</b>	<b>Current Status</b>
Decrease mortality rate from heart disease and stroke.			
Decrease mortality rate for heart disease and stroke among Missourians.	Age-adjusted mortality rate for heart disease Age-adjusted mortality rate for stroke	Vital statistics	2003: 261.2 per 100,000 population 2003: 56.8 per 100,000 population
Eliminate racial/ethnic and sex disparities among Missourians in heart disease and stroke mortality.	Age-adjusted mortality rate for heart disease by race/ethnicity  Age-adjusted mortality rate for stroke by race/ethnicity  Age-adjusted mortality rate for heart disease by sex  Age-adjusted mortality rate for stroke by sex	Vital statistics	2003: white: 254.9 per 100,000 population; AA: 340.8 per 100,000  2003: white: 55.7 per 100,000; AA: 68.3 per 100,000  2003: Female: 217.7 per 100,000; Male: 318.7 per 100,000  2003: Female: 55.9 per 100,000; Male: 57.2 per 100,000

## Prevention of Risk Factors

<b>Goal/Objective</b>	<b>Indicator</b>	<b>Data Source</b>	<b>Current Status</b>
Increase the number of Missouri adults engaging in heart healthy behaviors.	Percentage of adults that were current smokers  Physical Inactivity  Percentage of adults eating 5+ servings/day fruits and vegetables	BRFSS tobacco use module (administered yearly)  BRFSS exercise module (administered yearly)  BRFSS fruits and vegetables module (administered in even years)	2004 24.1% of adults were current smokers  2004 24.8% of adults did not engage in any leisure time physical activity (physically inactive)  2004 22.7% of adults ate at least 5 servings of fruits and vegetables per day
Identify and list issues/barriers to worksite heart disease and stroke health promotion identified as a result of worksite projects.	Barriers to heart disease and stroke worksite health promotion.	Worksite inventory database.	Developmental – baseline = 0
Increase the number of partners that implement projects that target health provider questions to understand personal risk for heart disease and stroke.	A minimum of two partners per year will implement projects by 2007; by 2010 increase to four partners per year	MHDSP contract monitoring, process evaluation	Developmental – baseline = 0

## Detection and Treatment of Risk Factors

<b>Goal/Objective</b>	<b>Indicator</b>	<b>Data Source</b>	<b>Current Status</b>
Increase the number of Missourians that receive appropriate heart disease and stroke risk factor screenings with follow-up.	Blood Pressure Blood Cholesterol Glucose	PECS, MHDSP contract monitoring, KCNA database, StLFD database	Blood Pressure – Developmental Cholesterol – 74.3% (HEDIS); 76.4% (BRFSS); 2,771 (St. Louis Fire Dept.) Glucose- Developmental

**Continues...**

Reduce the percentage of individuals with diabetes in the FQHC Diabetes Registries by 10% that have the following:	Uncontrolled high blood pressure  Uncontrolled high cholesterol	PECS	2005 – Uncontrolled high blood pressure = 65%  2005- LDL > 100mg/dl = 52%
Offer at least two training opportunities per year for health care providers on best practices in regard to the detection, treatment, and management of heart disease and stroke and their risk factors.	Best practices for heart disease care  Best practices for stroke care	Contract Monitoring, follow-up surveys to health care providers to be developed by MHDSP	Developmental – baseline = 0
Increase to 70% the percentage of clients with CVD at FQHCs that have documented chronic disease self-management goals that are reviewed every six months with trained staff members.	Self-management goals on record in FQHCs	PECS	2005 – 44% of clients have documented self-management goals
10% of insurance payers will have policies in place that reimburse for cholesterol screening.	Self-reported policies reported by insurance providers	HEDIS, survey to be developed by MHDSP	Developmental – baseline = 0
Provide technical assistance to at least two community partners per year that will expand successful programs related to Missouri residents for:	Blood pressure knowledge Cholesterol awareness Knowledge of blood sugar numbers How to access programs to help manage/control high values	Contract monitoring, follow-up surveys to community participants to be developed by MHDSP	Developmental – baseline = 0
By 2007, increase the number of FQHCs from 5 to 10 who expand quality improvement efforts from diabetes by adding CVD and have developed registries to track patient progress.	FQHCs participating in CVD collaborative	PECS registries, contract agreements	Baseline – 2004, 5 FQHCs participating in CVD collaborative
By 2007, the percentage of adult Missourians who have high blood pressure that is under control will increase 10%	Missouri adults with documented hypertension that is under control	HEDIS	2003 – 54% under control
By 2007, the percentage of adult Missourians who have high cholesterol that is under control will increase 10%	Missouri adults with documented high cholesterol that is under control	HEDIS	2003 – 55% under control
Goal/Objective	Indicator	Data Source	Current Status
By 2010, the number of awareness/educational campaigns for the public in regard to the following will increase from 0 to 30 in their community:	Recognizing signs and symptoms of heart attack  Recognizing the signs and symptoms of stroke  Know your numbers (911)	MHDSP contract monitoring, evaluation survey, to be developed, of community campaigns and worksite programs	Developmental- baseline = 0

**Continues...**

By 2010, the number of Automatic External Defibrillators (AED) placed by the Office of Primary Care and Rural Health will increase from 160 in 2004 to 500.	AEDs placed in Missouri worksites and public places by the Office of Primary Care and Rural Health	Office of Primary Care and Rural Health; AED registry to be developed	2004 baseline- 160 AEDs placed
By 2008, the number of AED's available in public schools served by the Missouri School-Age Children's Health Services Program will increase from 0 to 100.	AEDs available in public schools served by MSCHSP	Database to be developed	2004 Baseline- 0 AEDs placed
By 2006, establish a baseline of the number of persons who receive CPR training in schools served by MSCHSP and the worksites assessed by the lead public health agencies, and by 2010 increase that percentage by 10%. (Baseline - 0)	Numbers of participants in CPR trainings	MHDSP contract monitoring; database to be developed	2004 baseline – 0
By 2010, increase the availability of 911 systems to all 115 counties in the state of Missouri.	Counties with 911 service for emergency response	Information Security Management, State of Missouri, and Office of Administration; Missouri EMS association	2004 baseline – 82 counties with 911 service
By 2007, identify the acute stroke treatment capacity in Missouri and create a plan to improve the acute stroke treatment system in Missouri.	Hospital responses to survey questions regarding acute stroke treatment and infrastructure to treat acute stroke	Survey to be developed; database to be developed to enter survey data	Developmental – baseline = 0
Goal/Objective	Indicator	Data Source	Current Status
Create an Acute Stroke System Development Plan.	Creation and dissemination of Plan	Plan to be developed	Developmental – baseline = 0
By 2010, increase the number of partners that provide stroke signs/symptoms awareness projects from 2 to 10.	Creation and maintenance of partners that address stroke	MHDSP contract monitoring; partner reports	2005 baseline – 2 projects
By 2006, identify the number of heart/stroke community education opportunities that stress prevention of recurrent heart attack or stroke events and were conducted with MHDSP collaboration or partnering during the year. By 2008, increase that number by 5%.	Heart disease and stroke community education events that stress prevention of recurrent heart attack or stroke	Survey and database to be developed; contract monitoring	Developmental – baseline = 0

# Glossary of Terms

**Age-adjusted death rate:** The number of deaths occurring per 100,000 population per year' calculated in accordance with a standard age structure to minimize the effect of age differences when rates are compared between populations or over time.

**Automated external defibrillators (AEDs):** An automated external defibrillator (AED) is a device used to detect and treat cardiac arrest due to cardiac arrhythmias. Uncorrected, these arrhythmias rapidly lead to irreversible brain damage and death. By applying a shock to the entire heart muscle, the AED uniformly clears the heart's electrical system, hopefully allowing it to resynchronize. The AED automatically determines if a shock is needed and automatically selects and delivers the appropriate energy level.

**Artery:** Vessels that carry oxygen-rich blood from the heart to the body. The major arteries of the heart are called the coronary arteries.

**Behavioral change:** An intervention approach that uses public information and education to promote behavioral patterns favorable to health for the population as a whole; also includes interventions (e.g., counseling) at the group or individual level for the same purpose.

**Behavioral Risk Factor Surveillance System BRFSS:** A state-based, CDC-sponsored system of health surveys that generate information about health risk behaviors and attitudes, clinical preventive practices, and health care access and use primarily related to chronic diseases and injury.

**Blood Cholesterol:** The blood concentration of a family of lipid or "fatty" molecular compounds obtained directly from the diet or produced in the body from fatty dietary components; a necessary factor in development of atherosclerosis; total cholesterol concentration is classified as "high" if it is > 200 mg/dl. Subtypes of cholesterol differ in their relation to CVD risk, with high-density lipoprotein (HDL) cholesterol considered "good", and low-density (LDL) cholesterol considered "bad".

**Blood Pressure:** A measure of the force used to circulate blood through the body. Systolic blood pressure measures the force when the heart contracts; diastolic blood pressure measures the force used to move blood when the heart is at rest between beats. Blood pressure is reported as systolic pressure over the diastolic pressure.

**Body Mass Index (BMI):** A measure of weight relative to height to determine if a person is underweight, normal weight, overweight or obese.

**Cardiopulmonary resuscitation (CPR):** Cardiopulmonary resuscitation or CPR, is any of the broad range of maneuvers and techniques used to restore spontaneous circulation, including rescue breathing and chest compressions. The main objective of CPR is to provide oxygen to the brain and heart until medical treatment can restore normal heart and breathing action.

**Cardiovascular disease (CVD):** Diseases of the heart and blood vessel system. These include the following:

- **Atherosclerosis-** A pathological condition affecting the medium-size and larger arteries, especially those that supply the heart (the coronary arteries), the brain (the carotid and cerebral arteries), and the lower extremities (the peripheral arteries), as well as the aorta. Atherosclerosis underlies the occurrence of heart attacks, many strokes, peripheral arterial disease, and the dissection or rupture of the aorta.
- **Congestive heart failure (CHF)-** Also known as heart failure. A serious condition in which the heart is unable to pump enough blood to supply the body's needs. CHF occurs when excess fluid starts to leak into the lungs, causing breathing difficulty, fatigue and weakness, and sleeping problems. High blood pressure is the number one risk factor for CHF.
- **Coronary heart disease (CHD)-** The most common form of heart disease. This type of heart disease is caused by a narrowing of the coronary arteries that feed the heart, which results in not enough oxygen-carrying blood reaching the heart.
- **Diseases of the heart-** Based on the International Classification of Diseases (ICD) codes and including coronary heart disease, congestive heart failure, and others. Importantly, this category does not include atherosclerosis or cerebrovascular disease (stroke).
- **Heart disease-** Referring to any affliction that impairs the structure of the heart (e.g., atherosclerotic and hypertensive diseases, congenital heart disease, rheumatic heart disease, and cardiomyopathies).
- **Stroke-** Also known as cerebrovascular disease, or a brain attack, the interruption of blood supply to the brain due to either an obstruction or rupture of a blood vessel. Strokes that are not fatal often lead to some level of physical or cognitive disability.

**Cardiovascular disease prevention:** A set of interventions designed to prevent first and recurrent CVD events (e.g., heart attack, heart failure, and stroke). For CVD, primary prevention refers to detection and control of risk factors, whereas secondary prevention includes long-term case management for survivors of CVD events. CVD prevention complements cardiovascular health (CVH) promotion.

**Cardiovascular health\ and health promotion:** A set of interventions designed to reduce a population's risk for CVD through policy, environmental, and behavioral changes; also supports other approaches that apply to people who have suffered recognized CVD events (e.g., by facilitating public access to emergency care or by fostering social/environmental and behavioral changes that reinforce secondary CVD prevention); sometimes identified with primordial CVD prevention; complements CVD prevention.

**Cholesterol:** A waxy substance produced by the body and taken in with food. The body needs cholesterol for functions such as making hormones. When too much cholesterol circulates in the blood, it leads to atherosclerosis and an increased risk of heart disease.

**Collaboration:** A group of people who work together toward a common goal and share decision making necessary to reach the goal.

**Coronary risk factors:** Factors associated with a higher incidence of coronary heart disease. The factors include tobacco use, high blood pressure, high blood cholesterol, and family history of heart disease, diabetes, and physical inactivity.

**Diabetes:** A metabolic disorder resulting from insufficient production or utilization of insulin, commonly leading to cardiovascular complications.

**Evaluation:** A systematic process for an organization to obtain information on its activities, its impacts, and the effectiveness of its work, so that it can improve its activities and describe its accomplishments.

**Evidence-based public health:** The use of agreed-upon standards of evidence in making decisions about public health policies and practices to protect or improve the health of populations.

**Fat:** One of the nutrients that supply calories to the body. The body needs only small amounts of fat. Foods contain different types of fat. Saturated fat, for example, is found in greatest amounts in food from animals, such as butter, cheese, milk, and cream, as well as meat and poultry skin. A few vegetable fats—coconut oil, cocoa butter, palm kernel oil, and palm oil—are also high in saturated fats. Unsaturated fats do not directly influence cholesterol levels and include olive, canola, sunflower seed, and safflower oils, and oils found in certain fish.

**Federally qualified health center (FQHC):** A FQHC is an American community based health organization. A FQHC provides comprehensive primary health, oral, and mental/substance abuse services to persons in all stages of the life cycle.

**Goal:** Broad statements that describe the desired longer-term impacts a program want to accomplish.

**Health disparities:** Differences in the burden and impact of disease among different populations, defined, for example, by sex, race or ethnicity, education or income, disability, place of residence, or sexual orientation.

**Healthy People 2010:** A national document that presents the most important health-related goals and objectives to be achieved in the United States by the year 2010.

**Heart Attack:** Death of, or damage to, part of the heart muscle due to an insufficient blood supply; caused by blockage of one or more of the coronary arteries. Also known as myocardial infarction.

**High blood pressure (Hypertension):** A long-term increase in blood pressure above its normal range, currently defined by the National High Blood Pressure Education Program as systolic blood pressure at or above 140 mm Hg (millimeters of mercury) or diastolic blood pressure at or above 90 mm Hg. When blood pressure is high, the heart works harder. The increased pressure can damage vessels in vital organs such as the heart, the brain, and the kidneys. Also known as hypertension.

**High risk approach:** An intervention strategy that targets only people with the highest levels of CVD risk factors for the purpose of reducing their level of risk to that of the most favorable level in the population.

**Incidence:** The number of new cases of a disease that develop in a population during a specific period of time.

**Lipids:** Fatty substances including cholesterol and triglycerides that are present in blood and body tissues.

**Modifiable characteristics:** Factors related to CVD risks that are amenable to change (e.g., diet, physical activity, smoking), in contrast to those that are intrinsic to the individual (e.g., age, race, sex, genetic traits).

**Mortality:** A measure of deaths occurring in a given population, location, or other group of interest during an interval of time, usually a year.

**Obesity:** An excess of body fat. The standard definition of obesity in adults is having a body mass index (BMI) of 30 or over.

**Objective:** Are the desired outcome or change expected in a target population as a result of the program.

**Overweight:** A high level of body fat. The standard definition of overweight in adults is having a body mass index (BMI) between 25 and 29.9.

**Partners:** Individuals and organizations that contribute a variety of resources and skills during the development, implementation, evaluation and realignment of the Missouri Heart Disease and Stroke Prevention Program Strategic Plan. Partnerships may be formal, informal, internal, and external. Partners will be involved at different times and in different ways, but all will make positive contributions towards reducing the burden of cardiovascular disease in Missouri.

**Peripheral arteries:** Arteries in the upper and lower extremities (arms and legs).

**Policy and environmental change:** An intervention approach to reducing the burden of chronic disease that focuses on enacting effective policies (e.g., laws, regulations, formal and informal rules) or promoting environmental change (e.g., changes to economic, social, or physical environments).

**Prevalence:** The frequency of a particular condition within a defined population at a point in time.

**Primary CVD prevention:** A set of interventions, including the detection and control of risk factors, designed to prevent the first occurrence of heart attack, heart failure, or stroke among people with identifiable risk factors.

**Primordial CVD prevention:** A set of interventions targeting people without risk factors or CVD to prevent development of risk factors.

**Risk factor:** A habit, behavior, characteristic associated with increased frequency of specified health problems.

**Secondary prevention:** A set of interventions aimed at survivors of acute CVD events (e.g., heart attack, heart failure, stroke) or others with known CVD in which long-term case management is used to reduce disability and risk for subsequent CVD events.

**Strategy:** An action step performed to impact changes in objectives. Strategies are geared towards a target population and have a specific time period for implementation and completion.

**Survival:** Remaining alive for a specified period (e.g., beyond the 28-day definition of case fatality) after a CVD event.

**Triglycerides:** Lipids carried through the bloodstream to tissues. Most of the body's fat tissue is in the form of triglycerides, stored for use as energy. Triglycerides are obtained primarily from fat in foods.

**Vascular:** A term to describe blood vessels.

**911:** An emergency number telephone system to activate the emergency medical system team.

# Acronyms

AAA .....	Area Agency on Aging	KC-QIC .....	Kansas City Quality Improvement Consortium
ADA .....	American Diabetes Association	LPHA .....	Local Public Health Agency
AED .....	Automatic External Defibrillator	MAFP .....	Missouri Association of Family Physicians
AHA .....	American Heart Association	MAHP .....	Missouri Association of Health Plans
ASA .....	American Stroke Association	MAOPS .....	Missouri Association of Osteopathic Physicians and Surgeons
BCCP .....	Breast and Cervical Cancer Control Project	MDPCP .....	Missouri Diabetes Prevention and Control Program
BHP .....	Bureau of Health Promotion	MHA .....	Missouri Hospital Association
BRFSS .....	Behavioral Risk Factor Surveillance System	MHDSP .....	Missouri Heart Disease and Stroke Prevention Program
CCDC .....	Cancer and Chronic Disease Control	MICA .....	Missouri Information for Community Assessment
CDC .....	Centers for Disease Control and Prevention	MOU .....	Memorandum of Understanding
CDPHP .....	Chronic Disease Prevention and Health Promotion	MONA .....	Missouri Nurses Association
CHI .....	Community Health Information	MPCA .....	Missouri Primary Care Association
CHIME .....	Center for Health Information Management and Evaluation	MPCRF .....	Missouri Patient Care Review Foundation
CHSS .....	Community Health Systems and Support	MPHA .....	Missouri Public Health Association
CLPHS .....	Center for Local Public Health Services	MSCHSP .....	Missouri School-Age Children's Health Services Program
CME .....	Continuing Medical Education	MU .....	University of Missouri
CPR .....	Cardiopulmonary Resuscitation	OMH .....	Office of Minority Health
CVD .....	Cardiovascular Disease	OSEPHI .....	Office of Surveillance, Evaluation, Planning and Health Information
CVD-TI .....	Cardiovascular Disease – Targeted Initiative	OWH .....	Office on Women's Health
DESE .....	Department of Elementary and Secondary Education	PCP .....	Primary Care Physicians
DFS .....	Division of Family Services	PCRH .....	Primary Care and Rural Health
DHSS .....	Department of Health and Senior Services	PE .....	Physical Education
ECC .....	Emergency Cardiac Care	PECS .....	Patient Electronic Care System
EMS .....	Emergency Medical Services	REACH .....	Racial and Ethnic Approaches to Community Health
FQHC .....	Federally Qualified Health Centers	RWJ .....	Robert Wood Johnson
GWTG .....	Get With the Guidelines	SE .....	Southeast
HEDIS .....	Health Plan Employer Data and Information Set	SEMO .....	Southeast Missouri
HIP .....	Healthy Initiatives Project	SHEP .....	School Health Education Profile
JCAHO .....	Joint Commission on Accreditation of Healthcare Organizations	SHI .....	School Health Index
JNC7	Joint National Committee on Prevention, Detection, and Treatment of High Blood Pressure	SLU .....	St. Louis University
KC .....	Kansas City	UOE .....	University Outreach and Extension
KC NCSD .....	Kansas City Neighborhood and Community Services Department	YRBS .....	Youth Risk Behavior Survey

# External Partner Agencies and Organizations

Area Agency on Aging	MO Department of Agriculture	PedNet Coalition
American Cancer Society	MO Department of Economic Development	Phelps County Health Department
Missouri Diabetes Association	MO Department of Elementary and Secondary Education	Platte County Health Department
American Heart Association	MO Department of Natural Resources	Primaris
American Stroke Association	MO Department of Public Safety	Randolph County Health Department
Boone County Health Department	MO Department of Social Services – Division of Family Services	Sister to Sister Foundation
Boone Hospital Center	MO Department of Transportation	St. Louis County Health Department
Bootheel Tri-County Task Force	MO Governor's Council on Physical Fitness and Health	St. Louis District Dairy Council
Butler County Health Department	Missouri Association of Osteopathic Physicians and Surgeons	St. Louis Fire Department
Cape Girardeau Health Department	Missouri Hospital Association	St. Louis University – School of Public Health
Clay County Health Department	Missouri Coordinated School Health Coalition	Prevention Research Center
Deaconess Parish Nurse Ministries	Missouri Nurses Association	CDC – Atlanta
Heart Health Coalitions	Missouri Parks and Recreation Association (Hearts N' Parks)	National Stroke Association
Kansas City Health Department	Missouri Primary Care Association	American Stroke Association
Kansas City Quality Improvement Consortium	Missouri Society of Public Health Educators	NINDS "Know Stroke" Project – St Louis
Marion County Health Department	MU Extension	Missouri's JCAHO Primary Stroke Centers
Mid-America Coalition on Health Care	Newton County Health Department	Springfield/Greene County Health Department

# Department of Health and Senior Services Internal Partners

Bureau of Childcare	Missouri Arthritis and Osteoporosis Program	Office on Women's Health
Bureau of Emergency Medical Services	Missouri Diabetes Prevention and Control Program	Bureau of Health Promotion
Center for Health Information Management and Evaluation	Office of Minority Health	Office of Primary Care and Rural Health
Center for Local Public Health Services	Office of Surveillance, Evaluation, Planning and Health	WISEWOMAN Program
Coordinated School Health Program	Information	

# The American Heart Association Chain of Survival



When a cardiovascular emergency happens, every second counts. As emergency responders race to save the life of someone suffering cardiac arrest, or suffering a heart attack or stroke, every minute that passes can place the victim at a greater risk of permanent disability or death. Cardiac emergencies often have the highest fatality rates among all emergency events because they demand some of the quickest response times.

The Chain of Survival is a series of critical steps that can help save lives during cardiovascular emergencies. The links are:<sup>24,25</sup>

## **Early Access:**

- Recognize an emergency (know the signs and symptoms of cardiac arrest, a heart attack or stroke) and call 911 immediately.

## **Early CPR:**

- Perform cardiopulmonary resuscitation (CPR) if the victim is unconscious and has suffered from cardiac arrest. CPR is the critical link between the first and third link. CPR will keep oxygen-rich blood flowing to the brain and heart while waiting for an AED to arrive. The earlier a victim in cardiac or respiratory arrest receives CPR, the greater the chance of survival.

## **Early Defibrillation:**

- Most sudden cardiac arrest victims are in ventricular fibrillation (VF). VF is an abnormal heart rhythm that prevents the heart from pumping blood. Use an automated external defibrillator (AED) to deliver an electrical shock to restore the heart's normal rhythm. The sooner the AED is used, the greater the victim's chance of survival.

## **Early Advanced Care:**

- The fourth link in the Chain of Survival is early advanced care. Trained paramedics (EMS personnel) can give basic life support, defibrillation and more advanced care. The advanced care can include helping the heart that is in ventricular fibrillation respond to the defibrillation or helping the heart maintain a normal rhythm or a successful defibrillation.

# Crosswalk of Healthy People Objectives with Goals

<b>HEALTHY PEOPLE 2010 OBJECTIVES<sup>22</sup></b>	<b>GOAL 1</b>	<b>GOAL 2</b>	<b>GOAL 3</b>	<b>GOAL 4</b>
12-1. Reduce coronary heart disease deaths.	X	X	X	X
12-2. Increase the proportion of adults aged 20 years and older who are aware of the early warning symptoms and signs of a heart attack and the importance of accessing rapid emergency care by calling 911.		X		
12-3. Increase the proportion of eligible patients with heart attacks who receive artery-opening therapy within an hour of symptom onset.		X	X	
12-4. Increase the proportion of adults aged 20 years and older who call 911 and administer cardiopulmonary resuscitation (CPR) when they witness an out-of-hospital cardiac arrest.			X	
12-5. Increase the proportion of eligible persons with witnessed out-of-hospital cardiac arrest who receive their first therapeutic electrical shock within 6 minutes after collapse recognition.			X	
12-6. Reduce hospitalizations of older adults with congestive heart failure as the principal diagnosis.				X
12-7. Reduce stroke deaths.	X	X	X	X
12-8. Increase the proportion of adults who are aware of the early warning signs and symptoms of a stroke.	X		X	
12-9. Reduce the proportion of adults with high blood pressure.		X		
12-10. Increase the proportion of adults with high blood pressure whose blood pressure is under control.		X		
12-11. Increase the proportion of adults with high blood pressure who are taking action (for example, losing weight, increasing physical activity, or reducing sodium intake to help control their blood pressure).		X		
12-12. Increase the proportion of adults who have had their blood pressure measured within the preceding 2 years and can state whether their blood pressure was normal or high.		X		
12-13. Reduce the mean total cholesterol levels among adults.		X		
12-14. Reduce the proportion of adults with high total blood cholesterol levels		X		
12-15. Increase the proportion of adults who have had their blood cholesterol checked within the preceding 5 years.		X		
12-16. Increase the proportion of persons with coronary heart disease who have their LDL-cholesterol treated to a goal of less than or equal to 100 mg/dl.		X		

# Stroke Chain of Survival

When a stroke occurs, time is of the essence. A person experiencing an ischemic stroke has three hours from the initial onset of symptoms until the most innovative therapy is no longer helpful. By acting quickly to this emergency situation, it is possible to decrease the amount of permanent damage caused by the stroke.

The Stroke Chain of Survival is a series of critical steps that can help save lives during an emergency situation. Remember that time lost is brain lost. The links are:<sup>23,24</sup>

- **Rapid recognition and reaction to stroke warning signs:**

Recognize the warning signs and note the time when they first occur. Call 911 immediately. Tell the operator that the person is experiencing stroke warning signs.

**The symptoms of stroke are:**

- Sudden weakness or numbness of the face, arm and leg (Especially on one side of the body)**
- Sudden confusion, trouble speaking or understanding**
- Sudden trouble seeing in one or both eyes**
- Sudden trouble walking, dizziness, loss of balance or coordination**
- Sudden severe headache with no known cause**

- **Rapid start of pre-hospital care:**

Receive early assessments and care and pre-hospital notification by Emergency Medical Services (EMS) personnel.

- **Rapid EMS system transport and hospital pre-notification:**

Get to an appropriate hospital quickly via the EMS-ambulance personnel will notify the emergency room that the potential stroke victim is en-route.

- **Rapid diagnosis and treatment at the hospital:**

Receive prompt evaluation of medical data and treatment to restore blood flow to the brain or other treatments as appropriate by a properly staffed and equipped hospital.



Reference Card from the

# Seventh Report of the Joint National Committee on Prevention Detection, Evaluation and Treatment of High Blood Pressure (JNC 7)

## EVALUATION

CLASSIFICATION OF BLOOD PRESSURE (BP)*			
CATEGORY	SBP MMHG	and	DBP MMHG
Normal	<120	and	<80
Prehypertension	120-139	or	80-89
Hypertension, Stage 1	140-159	or	90-99
Hypertension, Stage 2	≥160	or	≥100

\* See Blood Pressure Measurement Techniques (reverse side)

Key: SBP = systolic blood pressure DBP = diastolic blood pressure

## DIAGNOSTIC WORKUP OF HYPERTENSION

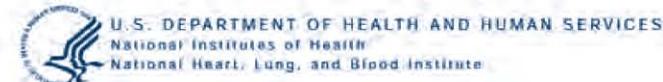
- Assess risk factors and comorbidities.
- Reveal identifiable causes of hypertension.
- Assess presence of target organ damage.
- Conduct history and physical examination.
- Obtain laboratory tests: urinalysis, blood glucose, hematocrit and lipid panel, serum potassium, creatinine, and calcium. Optional: urinary albumin/creatinine ratio.
- Obtain electrocardiogram.

## ASSESS FOR MAJOR CARDIOVASCULAR DISEASE (CVD) RISK FACTORS

• Hypertension	• Physical inactivity
• Obesity	• Microalbuminuria, estimated glomerular filtration rate <60 mL/min
(body mass index ≥30 kg/m <sup>2</sup> )	
• Dyslipidemia	• Age (>55 for men, >65 for women)
• Diabetes mellitus	• Family history of premature CVD (men age <55, women age <65)
• Cigarette smoking	

## ASSESS FOR IDENTIFIABLE CAUSES OF HYPERTENSION

• Sleep apnea	• Cushing's syndrome or steroid therapy
• Drug induced/related	• Pheochromocytoma
• Chronic kidney disease	• Coarctation of aorta
• Primary aldosteronism	• Thyroid/parathyroid disease
• Renovascular disease	

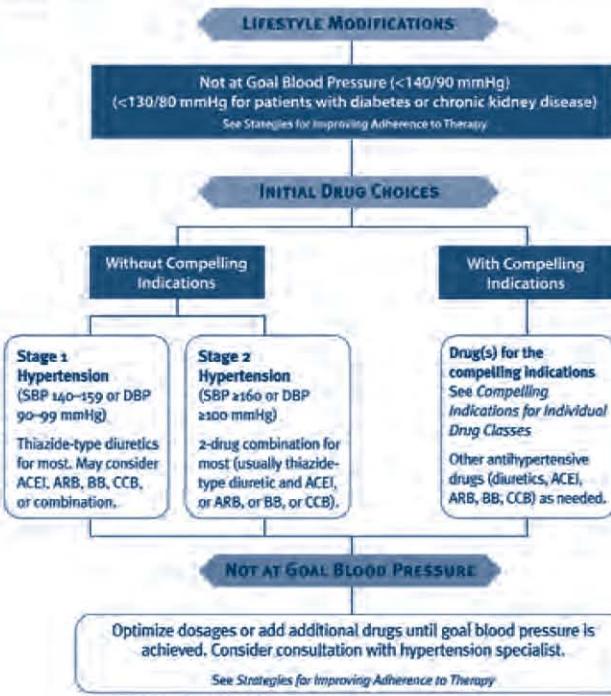


## TREATMENT

### PRINCIPLES OF HYPERTENSION TREATMENT

- Treat to BP <140/90 mmHg or BP <130/80 mmHg in patients with diabetes or chronic kidney disease.
- Majority of patients will require two medications to reach goal.

### ALGORITHM FOR TREATMENT OF HYPERTENSION



BLOOD PRESSURE MEASUREMENT TECHNIQUES	
METHOD	NOTES
In-office	Two readings, 5 minutes apart, sitting in chair. Confirm elevated reading in contralateral arm.
Ambulatory BP monitoring	Indicated for evaluation of "white coat hypertension." Absence of 10-20 percent BP decrease during sleep may indicate increased CVD risk.
Patient self-check	Provides information on response to therapy. May help improve adherence to therapy and is useful for evaluating "white coat hypertension."

#### CAUSES OF RESISTANT HYPERTENSION

- Improper BP measurement
- Excess sodium intake
- Inadequate diuretic therapy
- Medication
  - Inadequate doses
  - Drug actions and interactions (e.g., nonsteroidal anti-inflammatory drugs (NSAIDs), illicit drugs, sympathomimetics, oral contraceptives)
  - Over-the-counter (OTC) drugs and herbal supplements
- Excess alcohol intake
- Identifiable causes of hypertension (see reverse side)

#### COMPELLING INDICATIONS FOR INDIVIDUAL DRUG CLASSES

COMPELLING INDICATION	INITIAL THERAPY OPTIONS
• Heart failure	THIAZ, BB, ACEI, ARB, ALDO ANT
• Post myocardial infarction	BB, ACEI, ALDO ANT
• High CVD risk	THIAZ, BB, ACEI, CCB
• Diabetes	THIAZ, BB, ACEI, ARB, CCB
• Chronic kidney disease	ACEI, ARB
• Recurrent stroke prevention	THIAZ, ACEI

Key: THIAZ = thiazide diuretic, ACEI= angiotensin converting enzyme inhibitor, ARB = angiotensin receptor blocker, BB = beta blocker, CCB = calcium channel blocker, ALDO ANT = aldosterone antagonist.

#### STRATEGIES FOR IMPROVING ADHERENCE TO THERAPY

- Clinician empathy increases patient trust, motivation, and adherence to therapy.
- Physicians should consider their patients' cultural beliefs and individual attitudes in formulating therapy.

The National High Blood Pressure Education Program is coordinated by the National Heart, Lung, and Blood Institute (NHLBI) at the National Institutes of Health. Copies of the JNC 7 Report are available on the NHLBI Web site at <http://www.nhlbi.nih.gov> or from the NHLBI Health Information Center, P.O. Box 30105, Bethesda, MD 20824-0105; Phone: 301-592-8573 or 240-629-3255 (TTY); Fax: 301-592-8563.

#### PRINCIPLES OF LIFESTYLE MODIFICATION

- Encourage healthy lifestyles for all individuals.
- Prescribe lifestyle modifications for all patients with prehypertension and hypertension.
- Components of lifestyle modifications include weight reduction, DASH eating plan, dietary sodium reduction, aerobic physical activity, and moderation of alcohol consumption.

#### LIFESTYLE MODIFICATION RECOMMENDATIONS

MODIFICATION	RECOMMENDATION	Avg. SBP REDUCTION RANGE†
Weight reduction	Maintain normal body weight (body mass index 18.5-24.9 kg/m <sup>2</sup> ).	5-20 mmHg/10 kg
DASH eating plan	Adopt a diet rich in fruits, vegetables, and lowfat dairy products with reduced content of saturated and total fat.	8-14 mmHg
Dietary sodium reduction	Reduce dietary sodium intake to $\leq$ 100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2-8 mmHg
Aerobic physical activity	Regular aerobic physical activity (e.g., brisk walking) at least 30 minutes per day, most days of the week.	4-9 mmHg
Moderation of alcohol consumption	Men: limit to $\leq$ 2 drinks* per day. Women and lighter weight persons: limit to $\leq$ 1 drink* per day.	2-4 mmHg

\*1 drink = 1/2 oz or 15 mL ethanol (e.g., 12 oz beer, 5 oz wine, 1.5 oz 80-proof whiskey).

† Effects are dose and time dependent.



#### U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

National Heart, Lung, and Blood Institute

National High Blood Pressure Education Program

NIH Publication No. 03-5231

May 2003

# References

1. Missouri Center for Health Information and Evaluation (CHIME): Missouri Information for Community Assessment (MICA). Jefferson City, Missouri: Missouri Department of Health and Senior Services; accessed April, 2005. <http://www.health.state.mo.us/MICA/>
2. U.S. Department of Health and Human Services. *A Public Health Action Plan to Prevent Heart Disease and Stroke*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2003.
3. Matson-Koffman DM, JN Brownstein, JA Neiner, and ML Greaney. 2005 A Site-specific Literature Review of Policy and Environmental Interventions that Promote Physical Activity and Nutrition for Cardiovascular Health: What Works? *American Journal of Health Promotion*, 19(3): 167-193.
4. Cooper R, J Cutler, P Desvigne-Nickens, SP Fortmann, L Friedman, R Havlik, G Hogelin, J Marler, P McGovern, G Morosco, L Mosca, T Pearson, J Stamler, D Stryer, and T Thom. 2000 Trends and Disparities in Coronary Heart Disease, Stroke, and Other Cardiovascular Diseases in the United States. *Circulation*, 19:3137-3147.
5. Missouri Census Data Center. Jefferson City, Missouri: Missouri Office of the Secretary of State; Accessed August 2005. <http://mcdc.missouri.edu/>
6. The Burden of Chronic Disease and their Risk Factors: National and State Perspectives. Centers for Disease Control and Prevention. 2004. Atlanta: U.S. Department of Health and Human Services.
7. Centers for Disease Control and Prevention. National Center for Health Statistics. Atlanta, Georgia; accessed April, 2005. <http://www.cdc.gov/nchs/fastats/heart.htm> and <http://www.cdc.gov/nchs/fastats/stroke.htm>
8. Brownson, R.C., M. Van Tuinen and C.A. Smith. Cardiovascular Disease in Missouri: Mortality, Hospital Discharges and Risk Factors. 1990. *Missouri Medicine*. 87(4): 225-7.
9. Tranche, S., A. Galgo, X. Mundet, M.A. Sanchez-Zamorano, and A.P. Karen. Cardiovascular Risk Factors in Type 2 Diabetic Patients: Multifactorial Intervention in Primary Care. 2005. *Kidney International*. 93 (supplement): S55-62.
10. Laaksonen, D.E., L. Niskanen, H.M. Lakka, T.A. Lakka, and M. Uusitupa. Epidemiology and Treatment of the Metabolic Syndrome. 2004. *Ann Medicine*. 36(5): 332-46.
11. Cziraky, M.J. Management of dyslipidemia in patients with metabolic syndrome. 2004. *Journal of the American Pharmaceutical Association*. 44(4): 478-88.
12. Genest Jr, J. and J.S. Cohn. Clustering of Cardiovascular Risk Factors: Targeting High-Risk Individuals. *American Journal of Cardiology*. 1995. 76(2): 8A-20A.
13. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Atlanta, Georgia: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; accessed April, 2005. <http://www.cdc.gov/brfss/>
14. Pearson, T.A., T.L. Bazzarre, S.R. Daniels, J.M. Fair, S.P. Fortmann, B.A. Franklin, L.B. Goldstein, Y. Hong, G.A. Mensah, J.F. Sallis, Jr, S. Smith, Jr, N.J. Stone, and K.A. Taubert. American Heart Association Guide for Improving Cardiovascular Health at the Community Level. *Circulation*. 2003. 107: 645-651.
15. Centers for Disease Control and Prevention. Declining Prevalence of No Known Major Risk Factors for Heart Disease and Stroke Among Adults – United States, 1991—2001. *MMWR*. 2004. 53(01): 4-7.
16. Catlin, T., E. Simoes, and R. Brownson. Environmental and Policy Factors Associated with Overweight Among Adults in Missouri. *American Journal of Health Promotion*. 2003. 17(4): 249-258.
17. Mokdad, A.H., E.S. Ford, B.A. Bowman, W.H. Dietz, F. Vinacor, V.S. Bales, and J.S. Marks. Prevalence of Obesity, Diabetes, and Obesity-Related Risk Factors, 2001. *Journal of the American Medical Association*. 2003. 289(1): 76-79.
18. Mokdad, A.H., M.K. Serdula, W.H. Dietz, B.A. Bowman, J.S. Marks, and J.P. Koplan. The Spread of the Obesity Epidemic in the United States, 1991-1998. *Journal of the American Medical Association*. 1999. 282(16): 1519-1522.
19. Nestle, M. and M.F. Jacobson. Halting the Obesity Epidemic: A Public Health Policy Approach. *Public Health Reports*. 2000; 115(1): 12-24.
20. Walcott-McQuigg, J.A. The Relationship Between Stress and Weight-Control Behavior in African-American Women. *Journal of the National Medical Association*. 1995. 87(6): 427-32.
21. National Heart, Lung, and Blood Institute. Clinical Guidelines on the Identification, Evaluation, and Treatment of Obesity in Adults: The Evidence Report; NHLBI Obesity Education Initiative Expert Panel. 1998. Washington, D.C.: U.S. Department of Health and Human Services.
22. U.S. Centers for Disease Control and Prevention. Healthy People 2010. Atlanta, Georgia: U.S. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 2000.
23. The American Stroke Association (ASA) [www.strokeassociation.org](http://www.strokeassociation.org)
24. The American Heart Association (AHA) [www.americanheart.org](http://www.americanheart.org)
25. American Red Cross (ARC) [www.chainofsurvival.com](http://www.chainofsurvival.com)
26. National High Blood Pressure Education Program. Reference Care from the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7). Bethesda, Maryland: National Heart, Lung, and Blood Institute, Publication number 03-5231, May 2003. [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)

# Resources

U.S. Department of Health and Human Services. *Prevention Works: CDC Strategies for a Heart-Healthy and Stroke-Free America*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2004.

U.S. Department of Health and Human Services. *A Public Health Action Plan to Prevent Heart Disease and Stroke*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2003.

Association of State and Territorial Health Officials, and National Association of County and City Health Officials. *Health Departments Take Action: A Compendium of State and Local Models Addressing Racial and Ethnic Disparities in Health*. Washington, DC, 2001.

American Heart Association. *Heart Disease and Stroke Statistics – 2005 Update*. Dallas, Texas: American Heart Association; 2005.

Mattessich, Paul, Murray-Close, Marta; Monsey, Barbara. *Collaboration: What Makes it Work, 2<sup>nd</sup> Edition*. Saint Paul, Minnesota: Amherst H.Wilder Foundation, 2001.

Association of State and Territorial Directors of Health Promotion and Public Health Education. *Policy and Environmental Change: New Directions for Public Health*. U.S. Centers for Disease Control and Prevention, Final Report, 2001.

U.S . Centers for Disease Control and Prevention. *Healthy People 2010*. Atlanta, Georgia: U.S. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 2000.

Missouri Bureau of Health Informatics: Missouri Information for Community Assessment (MICA). Jefferson City, Missouri: Missouri Department of Health and Senior Services, 2005.

National High Blood Pressure Education Program. *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7)*. National Institutes of Health, National Heart, Lung and Blood Institute, 2003.

National Cholesterol Education Program. *Detection, Evaluation and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)*. National Institutes of Health, Section VI.

Brownson, R.C., Smith, C.A., et al. *Prevention Cardiovascular Disease through Community-based Risk Reductions: The Bootheel Heat Project*. American Journal of Public Health, 86(2), 206-213, February 1996.

# Notes

---

